TECHNOLOGY DEPT.

April 17, 1940

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DETROIT

NATIONAL PETROLEUM NEWS

Clive M. Alexander

Elected to the board of directors of Aetna Oil Service Co., Louisville, Ky., and made vice president in charge of refining and transportation.

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C. L. Henderson

The new president of the Western Petroleum Refiners Assn., C. L. Henderson, has been, in his characteristically even-tempered way, one of that organization's most active and influential members for the past 22 years. He has served several terms as director and as a vice president. Behind the scenes he has been a tireless worker.

"Curt" Henderson is a Tennessean, the son of a physician who only recently retired after more than 50 years of continuous practice. Born in Piedmont, Tenn., Mr. Henderson attended the University of Tennessee. He holds a Bachelor of Science degree in both electrical and mechanical engineering, and a masters degree in electrical engineering.

It was only natural that the young Tennessean, with all that electrical engineering education, should start his business career with a utility company—the Henry L. Doherty organization. He worked in several states until finally in 1917 he switched to the oil refining industry when he joined the former Sterling Oil & Refining Co.

In January of 1923 Mr. Henderson joined the Vickers Petroleum Co., as vice president and general manager, and with its president, J. A. Vickers, has made the company one of the best known of the Independents in the Mid-Continent.

Mr. Henderson is the 15th president that Western Petroleum Refiners Assn. has had in its 28 years. The W.P.R.A., organized at a meeting of 19 refiners in Kansas City, Mo., Dec. 18, 1912, is the second oldest oil trade association in the U. S.

NATIONAL PETROLEUM NEWS

VOLUME 32 WEDNESDAY, APRIL 17, 1940 NUMBER 16

A.P.I. Meeting For Marketers Wins Approval

N. P. N. News Bureau

CHICAGO, April 16.—Widespread interest among oil marketers in the April 22 meeting here of the central regional committee of American Petroleum Institute's marketing division was reported today by B. L. Majewski, Deep Rock Oil Corp., regional chairman. Meeting will start at 9:30 AM in the Red Lacquer Room, Palmer House.

"Many marketing men have gone out of their way to express their interest. A large attendance is assured," said Mr. Majewski. He emphasized that the meeting will be open to all.

Program for next Monday's meeting will be opened with a talk explaining purposes of regional A.P.I. marketing committees, given by Eric V. Weber, Cincinnati, of Eureka Oil Co., an Independent marketer who is marketing vice president of the A.P.I. Then follows a series of addresses on lubrication, marketing costs, octane requirements, and diesel fuels and lubricants, each given by an expert in that line and to be followed by open forum discussions of these papers.

Open Forum Discussion

R. A. Ludlow, program director of the A.P.I. lubrication committee, will discuss the committee's 1940 program and then lead an open forum discussion.

Next, P. E. Lakin, St. Louis, vice president of Shell Oil Co., Inc., will speak on marketing costs, followed by a general discussion of the paper led by Paul Ryan, Cleveland, president of National Refining Co.

Convening again at 1:30 PM after the noon recess, the program lists talks on "Anti-Knock Octane Requirements of Today and Tomorrow," by R. C. Alden, Bartlesville, Okla., of Phillips Petroleum Corp., and on "Diesel Fuels and Lubricants" by L. C. Welch, Chicago, of Indiana Standard. Both papers will be followed by discussions led by the respective authors.

Two additional members have been added to the regional com-

(*Continued on page* 10)

1940 Auto Sales Up 23%

DETROIT—Factory sales of automobiles and trucks in first 3 months this year totaled 1,310,234, up 23% over first 1939 quarter, according to estimates by Automobile Manufacturers Assn. It was the best quarter since 1939. March sales, totaling 439,100 units, were 13% above last year.

Seek Export Rate on Lubes From Southwest to East

ST. LOUIS—In order to satisfy demand of the English-French buying pool that export lube loadings be made from North Atlantic ports, Southwestern Freight Bureau has approved request by Mid-Continent refiners for a 50c a hundredweight rate on lube rail-shipped from the Southwest to Carteret, N. J., for export. Domestic rate is 81c.

High tanker rates from Gulf to Atlantic ports, better convoy contacts and shorter sailing schedules from North Atlantic ports were reasons given.

European War Events Worry Tanker Market

By Teletype

NEW YORK, April 16.—Eastern oil marketing industry is closely watching the newest war development and how it might affect marketing operations of companies along the Eastern Seaboard.

"What will happen to Norwegian tankers, comprising 260 ships of 3,000,000 deadweight tons?"—that is the question bothering eastern marketers.

Tanker rates, which have been one of the principal cost factors in oil marketing along the East Coast, were anybody's guess here today. Consensus was that American coastwise rates would be higher—how much was an unanswerable question.

A considerable portion of the Norwegian tonnage has been under time charter to American oil companies for movement either from South America to North Atlantic, or from the Gulf and South America to neutral foreign ports.

What has happened, or will happen to these ships, seems to be the key to future of American coastwise rates.

If American oil companies are forced to enter the open charter market for tonnage to replace these Norwegian-flag vessels, the only place they could turn would be American tonnage. If higher rates for offshore movement lure away boats in the coastwise run, then oil men here fear what might happen to coastwise rates.

The greater effect of this would show up, they believe, later in the year, when demand for heating oils from the Gulf for the Eastern Seaboard causes a heavy call for bottoms. In recent years, tanker rates have always reached their peak when the call for bottoms to move heating oil was heaviest.

There seem to be two schools of thought as to what will happen to Norwegian and Scandinavian tanker tonnage. One is that, because of a relative shortage of bottoms, the Allies will take over Norwegian and Danish tonnage and operate them in convoys. The other opinion is that the Allied nations need foreign exchange more than tanker tonnage, and that the boats will be allowed to operate in relatively safe runs—South to North America for instance, to better the dollar exchange position of the allies.

The fact that British have their eyes on the Norwegian tanker fleet was confirmed here by one oil man in position to know. He reports that the British admiralty has radioed masters of Norwegian tankers to pull into the nearest British or French ports.

It may be a move to forestall

(*Continued on page* 20)

New York Suppliers Cancel Contracts on Resale Prices

N. P. N. News Bureau

NEW YORK, April 15.—Major oil companies who have been experimenting with retail price maintenance under the Feld-Crawford Fair Trade Act in New York, Kings, Queens, Bronx and Nassau counties since August, 1938, have suspended contracts with their dealers specifying minimum resale prices on their branded motor fuels.

Socony Vacuum Oil Co. Inc. announced to its dealers that contracts would be suspended April 10. Shell Oil Co. and Tidewater Associated Oil Co. followed a few days later, and Standard Oil Co. of New Jersey's discontinuance was effective today, April 15.

It was believed the oil companies found it practically impossible to "police" dealers and enforce terms of the contracts, and price-cutting had been so wide-spread they felt it was necessary to release their dealers from contracts so that they might "meet the competition of the price-cutters."

Dealers throughout metropolitan New York were said to be "surprised and chagrined" that the contracts were discontinued.

Joseph V. McCabe, counsel for the Associated Gasoline Retail Dealers of Nassau County told a meeting of the Association that "this decision takes away the only weapon which we had, no matter how poor it was."

The Nassau dealers have probably been more active in enforcing the provisions allowed under the act than any other association, bringing suits against dealers in the name of the Association, and failing in this, seeking actions in which only individual dealers were involved.

The failure of the courts to recognize damage against associations narrowed legal effectiveness of enforcement down to actions by individual dealers against other dealers handling the same brand of products. This put cost of litigation beyond reach of the average dealer, and hampered him considerably in his efforts to force price-cutters to obey the terms of their contracts.

ICC Prescribes Rules On Tank Truck Design

WASHINGTON, April 15.—Interstate Commerce Commission today prescribed regulations governing motor vehicle transportation of gasoline, liquefied petroleum gas and inflammable liquids generally, including tank specifications for such facilities, applicable to common and contract carriers in interstate commerce, effective June 15, 1940.

Order follows extensive investigation in docket Ex Parte No. MC-13 over past four years. Rules do not apply to private carriers but report declares "whether or to what extent, if at all, they should be so applied," is the subject of a special inquiry now pending.

Regulations on inflammable liquids were promulgated under Sec. 204 (A), (1), and (2) of Motor Carrier Act, 1935, and Transportation of Explosive Act of March 4, 1921.

Covers Vehicles and Tanks

Specifications cover in detail tank motor vehicle—equipment, accessories, wheels tires, fuel feed system, brakes and regulations for loading, inspection and maintenance—as well as the tanks.

However, the ICC did not include basic requirements as to strength of shell, allowable materials or other basic design characteristics, holding that complete data was not yet available. Safety section of the Motor Carrier Bureau is investigating this matter and will amend present regulations accordingly at a later date, the ICC report said.

Inflammable liquid is defined as "any liquid which gives off inflammable vapors (as determined by flash point from Tagliabue's open-cup tester) at or below a temperature of 80° F."

Tank container is defined as "any container having a water capacity of 1000 lbs., 120 gals., or more in which is to be transported any inflammable liquid." The term includes "any such container capable of being attached to and detached from a motor vehicle, and such a container capable of being attached to and detached from a motor vehicle or other vehicle, a railroad car, or a vessel, interchangeably, the term does not exclude any such container not provided with such interchangeable features."

Cargo tank is defined as: "Permanently attached tank. Any tank designed to be permanently attached to any motor vehicle and in which is to be transported any inflammable liquid."

Chicago Marketing Meeting Expected To Attract Crowd

(*Continued from page 9*)

mittee: Frank E. Spencer, Chicago, of Spencer Petroleum Co., representing fuel oil distributors, and A. G. Talbot, Chicago, of Petroleum Exchange, representing tankcar marketers. This brings the total membership up to 40, of which 23 are representatives of the independent branch of the industry—including 14 jobbers—and 17 representing major companies.

A legal advisory committee has been set up, consisting of: Warren T. Spies, Chicago, of Cities Service Oil Co.; Wm. R. Allen, Chicago, of Sinclair Refining Co.; R. L. Foster, Bartlesville, of Phillips Petroleum Co.; and James T. Nielsen, Chicago, of The Texas Co.

Central Regional Committee, B. L. Majewski, chairman, of the American Petroleum Institute's Division of Marketing, announced the following program for its first quarterly meeting to be held at 9:30 A.M., Monday, April 22 in the Red Lacquer Room, Palmer House, Chicago:

MORNING SESSION, convening at 9:30 A.M.

1. **Purpose and objectives of Regional Committee activity.**
   By Eric V. Weber, Vice-president for Marketing, American Petroleum Institute and President, Ohio Petroleum Marketers' Assn.
2. **American Petroleum Institute, Lubrication Committee's Program for 1940.**
   By R. A. Ludlow, Director, immediately followed by open forum discussion of this paper, limited to 30 minutes, led by Mr. Ludlow.
3. **An Analysis of Marketing Costs.**
   By P. E. Lakin, Vice-President, Shell Oil Co., Inc., St. Louis.
   Immediately followed by open forum discussion of this paper led by Paul Ryan, President, National Refining Co., Cleveland, O.

Adjournment for Lunch

AFTERNOON SESSION, convening promptly at 1:30 P.M.

4. **Anti-Knock Octane Requirements Today-Tomorrow.**
   By R. C. Alden, Phillips Petroleum Company, Bartlesville, Oklahoma.
   Immediately followed by open forum discussion of this paper led by Mr. Alden.
5. **Diesel Fuels and Lubricants.**
   By L. C. Welch, Ass't. General Manager, Lubricating and Sales Technical Service Departments, Standard Oil Company of Indiana, Chicago, Illinois.
   Immediately followed by open forum discussion of this paper led by Mr. Welch.

Adjournment of general meeting will be followed by executive session of Central Regional Committee.

Thermal Poly Unit Planned by Conoco

TULSA, April 15.—Construction of a thermal polymerization plant has been started at the Continental Oil Co.'s refinery at Wichita Falls, Tex. Unit will consist of four furnaces, five towers, and a water cooling tower. Cost is estimated at $650,000.

The company also is enlarging its natural gasoline plant in the K.M.A. field near Wichita Falls. Cost of construction and equipment for this program is $200,000. Plant will be equipped to supply materials for the new poly plant at the refinery.

Commission Agents Make New Proposal

N. P. N. News Bureau

CLEVELAND, April 13.—Indiana Standard has postponed until June 1 the effective date of its new compensation schedule for commission agents in its Evansville, Ind., division which embraces the lower portions of Illinois and Indiana, according to word from an official of the commission agents' association which was organized to protest the new schedule.

Details of the Indiana company's proposed schedule could not be learned but one agent said it would result in reducing his commission about 0.25c per gal., although effect on other agents might vary, he added.

Commission agents' association, he said, has made a counterproposal, as follows:

A flat rate of 1c per gal. on any product sold to all classes of trade in a town where bulk plant is located; 1.5c per gal. on sales to dealers outside of towns and 2c to other buyers, such as farming trade, outside of town. This agent said that the counterproposal would result in a slight increase in commission, as far as his own operations were concerned.

Company officials have declined comment on the situation.

Bill Proposes New Pipelines Be Under ICC

N. P. N. News Bureau

WASHINGTON, April 15. — Railroad labor organizations' opposition to pipeline construction in the Southeast was reflected here this week by a bill introduced in Congress which would require Interstate Commerce Commission sanction for new lines or extensions and in their support of the Gillette bills for divorcement of pipelines, tankers and barges from rest of the industry.

Senator Johnson (Dem.), Colo. on April 11 in S. 3753 proposed ICC authorization be required before any pipeline company 'shall undertake the extension of its pipe line, or the construction of a new pipe line, or shall engage in transportation . . . by means of such additional or extended pipeline or newly constructed line." A finding that such new facilities are required to serve the "public convenience and necessity" would be required. Commission has no control over pipelines until they are built, the rail unions point out.

Railroad brotherhoods' opposition flows from the battle now being waged by railroads against the Southeastern pipeline project from Port St. Joe on Florida Gulf Coast, to Atlanta and Chattanooga, by Gulf and Pure oil companies, and reports of a new gasoline line from Baton Rouge, La. through Mississippi, Alabama, Georgia and the Carolinas to be jointly built by Shell and the New Jersey Standard. Reports could not be confirmed.

The rail unions' policy in this respect was formulated during a 4-day session of the Railway Labor Executives Ass'n. here last week.

While there appears to be no present prospect of passage of these bills, entry of the "big four" brotherhoods into the equation automatically enlists strong backing for the proposals.

Rep. Crosser (Dem.), Ohio, is expected to introduce a companion measure to the Johnson Bill in the House.

By Teletype

WASHINGTON—George A. Hill, Jr., President, Houston Oil Co., Houston, Tex. will discuss "state regulation" at round table discussion slated for Annual U. S. Chamber of Commerce meeting here April 29-May 2. Mr. Hill will tell what state regulation has accomplished in controlling natural resources.

Spring Change-Over Backed By Chrysler Service Chief

DETROIT — Chrysler has joined the list of automobile manufacturers endorsing Spring Change-Over for every car that has come through a hard winter.

Among the recommendations of W. A. Hilman, Chrysler service manager, are radiator flushing, draining winter lubricants and refilling with warm-weather grades, a thorough wash and polish job, chassis lubrication, and checking of tires, fan belt, battery and headlamps.

The first thing to do, according to Mr. Hilman, is to drain the radiator of anti-freeze (after there is no longer danger of a hard freeze) and reverse-flush the radiator to remove all rust and sediment.

"Merely running water through it via the filler pipe will not suffice," the Chrysler service chief cautioned. "Then the radiator hose and its connections should be inspected and tightened if necessary.

"Along with the other operations connected with the cooling system, the fan belt should be adjusted to the proper tension, as efficient service from the fan is very essential as the weather warms up.

Drain Winter Lubes

"All winter lubricants should be drained from engine, transmission and rear axle and the proper grades for warm weather driving substituted," he urged.

"The engine should be tuned to insure maximum performance coupled with economy. The tuning process should include removing and cleaning spark plug points; cleaning and adjusting ignition distributor points; checking valves for proper clearance between valve stem and tappets; cleaning carburetor and adjusting it for warm weather operation; removing fuel pump bowl and cleaning it of all foreign matter; disconnecting fuel lines and blowing them out with air; taking care that all connections are well tightened when replaced; checking all ignition wiring to make sure that connections are tight and insulation is free of fractures.

"Handling ease and safety will be promoted if steering gear and front axle controls are inspected and properly adjusted and lubricated. Front-end alignment of axle and wheels should be checked for toe-in, camber and caster.

"Brake check-up should include correct pedal to toe-board clearance and the condition of brake lining and clearance in the brake drum. In case the lining is worn and the drum scored, lining should be replaced and drum trued up. Brake shoes should be adjusted accurately during this check-up.

"As the electrical system may cause annoyance after the car has been through a hard winter, this should be checked very carefully. Wiring should be inspected to make sure that connections are tight and clean and that there is no damage to the insulation.

Check Battery and Tires

"The condition of the battery terminals is highly important. If the battery has been in service for a number of months or has been neglected, it should be cleaned and refilled with proper battery solution and then charged. Headlamps should be checked for their aim and focus. "The tires, which have probably taken a hard beating during the winter, should be checked for possible bruises and cuts," he recommended.

"It is very desirable that the car be washed thoroughly and then conditioned with a polish that does not contain excessive free acid. The reason for this is that a scum or film forms on the paint and chrome finish as a result of the salts and chlorides that so generally are used to combat slippery pavements. The excessive dirt that accumulates in streets when weather conditions do not permit their proper cleaning also contributes to this condition," he added.

Carry Spare Bulbs, Plugs

It is a good plan to carry spare light bulbs, spark plugs and fuses in the car, according to Mr. Hilman. Likewise, the motorist who does country driving should be sure that his jack and tire wrench are in the proper places and in condition to be used, he said in concluding his advice to car owners.

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OIL TAX NEWS...

Rails' 'Subsidy' Claims Hit in Eastman Report

N. P. N. News Bureau

WASHINGTON, April 15.—Highway transportation today stood acquitted of the long-standing charge that motor vehicles are not "paying their own way".

The verdict came in a belated report on public subsidies of transportation agencies by Chairman Eastman of the Interstate Commerce Commission, a holdover from Eastman's tenure as national transportation co-ordinator.

This conclusion was reached without including taxes paid by motor-vehicle users for Federal excise taxes on gasoline, oil, tires, tubes, motor-vehicles, etc. which were excluded as being taxes for the support of the general functions of government. Motor-vehicle tax revenues which have been "legally" diverted from highway and other purposes beneficial to motorists, also are excluded.

After making all necessary adjustments, Eastman, the veteran transportation authority, found that payments by motor vehicles into the public treasury exceeded assigned costs by $108,000,000 in 1921-1932, and by $277,000,000 in 1933-37, or by $385,000,000 in the entire period 1921-1937. Payments first exceeded assigned costs in 1927, Eastman's 4-volume tome reported. "For all practical purposes, it may be said that motor-vehicle users as a class have paid their way since 1927."

Discussing the highway transportation showing, Eastman concluded that "in the aggregate and in the country as a whole, they have paid sufficiently for many years, although this is not true of all classes of users."

Meanwhile, in the teeth of the Eastman report, which found that the railroads too had had the benefit of the public till in the form of land grants, RFC loans and use of waterway improvements, John J. Pelley, president, Association of American Railroads, today declared "the report on highway costs . . . boils down to this, that home-owners, farmers and others who pay general taxes ought to pay 60% of the total cost of highways and streets, while those who use the highways pay only 40% of the cost."

Rejects Rail's Contention

Eastman rejected the railroads' contention, advanced in the study, that the highways should be treated as if they were owned and operated by a public utility company seeking to charge the users enough to cover all annual costs, including overhead charges on investment."

The transportation authority concluded as to the waterway subsidies that, "Whether or not benefits so received can properly be regarded as sufficient justification for free use of facilities (Panama Canal excepted) constructed at public expense is wholly a question of sound public policy."

Pipelines Unsubsidized

As to pipelines report said public aids given the industry "are negligible." Describing pipelines as "a very special form of transportation," Eastman said it has played a part in bringing down the prices of petroleum products and natural gas. For the most part, Federal regulation has been limited, though it has increased of late years. The industry has prospered without public aid or the expenditure of public funds. In these respects it is largely unique.

"Pipe lines can contribute in important ways to the national defense."

Dealers Polled On Patman Bill

MILWAUKEE, April 13.—Houston was rejected as the site of the 1940 convention of the National Assn. of Petroleum Retailers at a meeting of the N.A.P.R. board of directors here April 10. The problem was referred to the ways and means committee. Plans for the convention, which will probably be held the last week in August or the first of September, will be announced in a week or so.

The directors decided to poll N.A.P.R. members on the Patman Chain-Store Tax Bill (HR 1 in Congress) which now includes filling stations. The following resolutions were adopted:

Urging standardization of octane tests for motor fuel (no test method recommended).

Urging passage of the Federal bill establishing a 4c per gallon excise tax on reclaimed motor oil and providing that reclaimed oil be branded as such.

Urging elimination of the 4c per gallon federal excise tax on refined motor oil.

Opposing HR 6552, a bill urging adoption of gasoline gradation.

May Broaden Probe Of Texas Stations

N. P. N. News Bureau

TULSA, April 13.—Courts of inquiry conducted by Texas attorney general's department into activities of Texas oil companies in the marketing field may spread to other Texas points.

Investigations at Dallas and Fort Worth apparently center on "control" by supplying oil companies over their leased station operators.

While the department stoutly maintains that the investigations are of anti-trust character, opinion among oil companies is that there is a close relationship between this investigation and the recent moves to apply the chain-store tax to service stations.

Questioning of service station operators is said to concern extent that supplying companies "dictate" as to service station price of gasoline, the make of tires and accessories to be sold, wages and hours, ratio of gasoline to lube oils bought and sold and clean rest rooms.

Connecticut Consumption Up

HARTFORD — Connecticut's taxable gasoline gallonage in February totaled 22,813,195 gals., nearly 10% above the 20,768,618 gals. in February, 1939.

COLUMBUS, Ohio — Taxable gasoline consumption in Ohio totaled 92,848,510 gallons in February, up 15.4% over last year.

Sun Builds Bulk Plants

NEW YORK, April 15.—Sun Oil Co. has let contract for the construction of a $100,000 bulk plant at Erie, Pennsylvania, and another $100,000 bulk plant is nearing completion at Oceanside, Long Island, N. Y.

The Erie plant will have two 25,000-bbl. storage tanks, one with a floating roof. A 2,700-foot pipeline will be constructed out into Lake Erie.

The plant at Oceanside is expected to be completed May 1st, and will have two ordinary 6000-bbl. tanks and one floating-roof 10,000-bbl. tank.

DEATHS

Earl Beebe

Earl Beebe, assistant cashier for the Mid-Continent Petroleum Corp., died April 11 at his home in Tulsa. He was 70 years of age, and had been with the company for the past 23 years.

* * *

H. B. Spence

H. B. Spence, executive secretary of the Permian Basin Assn., composed of producers and royalty owners in the west Texas oil fields, was killed in an automobile accident April 11, near Odessa, Tex. His home was in Midland, Tex.

* * *

William D. Bloodgood

William D. Bloodgood, 75, for many years president of the North Central Texas Oil Co., New York City, died April 8 at his home in Garden City, L. I.

ABOVE: Left to right, Col. Francis V. Lowden, executive committee member of New Jersey Petroleum Industries Committee; Gen. B. H. Markham, A.P.I.C. director; Gov. Moore; and Wm. M. Amos (Gulf Oil), executive committee chairman

New Jersey Tax Rally Attracts 600 Oil Men

TRENTON, N. J.—Nearly 600 oil men from all parts of the state attended the annual meeting sponsored by the New Jersey Petroleum Industries Committee here on April 8.

Governor A. Harry Moore was the principal speaker at the banquet which followed an afternoon program.

David H. Agans, master of the New Jersey State Grange, spoke on the farmer's stake in gasoline taxes. He attacked the diversion of automotive taxes to non-highway uses, contending that it was no different than taxing plows as motor vehicles have become an important tool of the farmer.

Progress the state is making in providing roads to meet the people's needs, was discussed by Highway Commissioner Sterner. A motion picture, "For Safety's Sake," was shown after his address.

The conference adopted resolutions attacking "diversion of state taxes and asking elimination of the "duplicating" federal tax on gasoline. New Jersey motorists have paid approximately $500,000,000 in gasoline and automotive taxes to provide funds for roads and bridges, aiding transportation of farm factory products and making more accessible the scenic beauties of the state thereby attracting more than $200,000,000 of tourist trade annually.

ABOVE: Mrs. E. A. Furfey, Trenton, receives $54.78 check as a Typical New Jersey Woman Motorist from H. V. Peterson, member of the New Jersey P.I.C. executive committee. Amount of the check represents average motorists' annual tax

BELOW: Members of the New Jersey P.I.C. executive committee meet. Left to right, E. J. Leary, secretary; H. V. Peterson (Hartol); Wm. M. Amos (Gulf Oil), chairman; and James J. Miller (Atlantic)

The Editor's Page—

Readers Comments and Opinions will be much Appreciated by—WARREN C. PLATT, Editor and Publisher, Penton Building, Cleveland, O.

Modernity and Management Mark Progress in New Stations

The gap between the modern and well equipped and well run service station and the poorly equipped and sloppily operated station, seems to be widening rapidly. Another year or so and one may well wonder if the poor and necessarily small gallonage station will not be poorer and smaller still, just about ready to quit unless unemployment is still most acute.

The above is the conclusion from observations made on a motor trip by the writer to Kansas and Oklahoma and finished last Saturday. The trip was the first by car to these points in 2 years but it was made over roads traveled many times in past years so that the writer's recollection on the general roadside picture was still good.

Here are some high spots:

MODERN BUILDINGS—

More modern type and complete stations with 2 or more bays for lubrication work.

Practically all these larger stations offered tires, batteries and other accessories.

These modern buildings almost invariably were oil company standard type buildings, of the type built or financed by the oil companies.

ANCIENT BUILDINGS—

Practically no modern equipment at the smaller and older type stations.

Few of the older type stations equipped for lubrication jobs or to sell accessories.

Practically never saw a single customer in the forlorn and obsolete stations. However, there were too many modern stations without customers also.

HOUSEKEEPING—

The housekeeping at both old and new stations was not good, and at the old type it was generally disgraceful. It is a crime that men who have been given new type stations do not do a good job of housekeeping. Too many fine station buildings were poorly managed and sloppy in appearance. The climax was a dirty out-of-order men's toilet in a new major company station, of the type planned and financed by that major company and in a prosperous town. The aged attendant, assisted by a young mechanic, apologized on my informing him as to the toilet, that he knew it had been out of order for 2 days but it was "too bad they could not get anyone to fix it." I wanted to ask what the mechanic was doing, but what is the use. Such inefficient and lazy people should be shoved out on WPA. Ten minutes work would have fixed that toilet.

By their toilet rooms ye can know them. Dirty wash bowls, soap containers empty or broken, paper towels—if any—scattered over the floor with other litter. These attendants cannot see that such advertising tells the customer that the attendants are likely as not to leave parts off cars—as they have with the writer—blow tires up too hard or not at all—slop over the battery—change only some of the plugs, in short such sloppiness spells sloppy selling and sloppy management. It spells poor business.

Heads of sales departments continue to report—privately of course—that the "Iowa Plan" has been the ruination of service, as well as price.

The best run and cleanest station, the snappiest of the whole lot, was a direct company operation—a price seller who is hourly managing the details of his business.

Too many "managements" like to sit around, comfortable and chew over "policies." Whereas MANAGEMENT should be out all the time checking all the details and all the small jobs—yes, inspecting wash basins and toilet bowls and making the attendants keep them clean and in order. If those details are properly attended to then MANAGEMENT is entitled to conclude that, if it pushes hard enough, the attendants may be prevailed upon to do a good job of selling and servicing.

ROADSIDE SIGNS—

One of these days this oil industry is going to receive an attack on its abuse of signs and the sign board privilege from which it will only recover by giving up a lot of its signs.

Many a road and street at the edge of towns and cities, and even down "main street" in many a town, were as garish as famous Broadway, New York, with many colored and illuminated signs. While road side signs for the most part are kept off the right-of-way, at the edge of towns where service stations are adjoining, signs on service station property are so thick that it is difficult to spell out any of them and particularly to find the route and other direction signs.

Oil marketing signs have increased way past the point of giving any fair return as advertisements. Many a road and street just blossoms out with signs, right down to the curb, like flowers in a large bed in summer, only the signs generally clash with each other and with one's idea of beauty.

Movements have been under way for years to abolish or limit the use of roadside signs. These movements have been gaining headway and it is our guess that unless the oil industry hurries and uses more judgment and taste than it has, its signs are liable to be swept off all roadsides, as if by a typical Southwestern hurricane. But this time they will never come back.

Maybe our super-sensitive Department of Injustice will permit the reorganized marketing division of the American Petroleum Institute, to study standards of practice in regard to roadside signs without attempting to send all to jail lest fewer signs might mean a shade less evidence of competition?

At all events here is one place where it will save the industry money and trouble to do a little "conserving" in the interest of more effective advertising and in the interest of being allowed any signs at all.

PRICE CUTTING MUCH ADVERTISED—

Many of these roadside signs herald prices, presumably cut prices. The signs come so fast and the prices are in such odd amounts that it is difficult to figure out what are cut prices and what are not. So many signs are in so-many gallons for a dollar or an odd number of cents that even a good mathematician is stumped to pick the lowest priced gasoline.

The impression of the average motorist must be that the oil industry is indulging in one grand, price-cutting row. The signs come so fast and in such confusing amounts that many a motorist may just say "Shucks, all I'm looking for is a clean toilet," and let it go at that.

HIGHER AND HIGHER OCTANE NUMBERS—

Many of these price cutting signs are tooting about "Octane Numbers." Some of the fanciest cut-price establishments and sign boards announced "80 Octane with tetraethyl lead" and one outfit said "Regular Gasoline and Leaded Gasoline."

The industry seems in for a long siege of not only price-sign headache but also an octane-number headache. The public either will be educated to all sorts of fancy ideas as to what is the "proper" octane rating of good motor fuel or it will not believe any of the octane talk.

It might seem desirable for the industry to study to see if, with so many price cutters seizing on "octane numbers" real and fancied and "leaded" gasoline for their sales talks, the industry would not be better off to forget all public refer-

ence to octane numbers and what makes them and sell motor fuel by name only.

That is the gist of the recommendation of the special technical committee of the Western Petroleum Refiners Ass'n. in its report to the annual meeting at Wichita, Kans. the other week. That committee said that the industry is doing itself much harm by talking octane numbers. It prefers that detailed specifications for any fuel be kept within the industry and even within the refinery fence, because specifications and methods of manufacture are changing so rapidly that it may only be a question of time when the now much exploited "Octanes" will be as obsolete a test as "Baume gravity" of ten years back.

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Stock Brokers Damn 'Calamity Howlers' While Glooming Loudly Over Oil Industry

It is probably asking too much of human beings to urge the stock-speculating, statistical soothsayers to take a bit of their own medicine. But here goes:

This morning's paper (April 14th) carries a good-sized advertisement of the stock exchange house of Fenner & Beane, with "customers' rooms" in most every city. The "ad" urges Americans to cheer up and pay no attention to the "calamity howlers" who, the "ad" points out, have been at it for a century and "they always have been wrong."

It is a typical New Yorker's "pep talk" to the rest of the United States which he views as "out in the provinces." The gospel, as thus handed down by Messrs. Fenner & Beane, is good sound Babbittarian dope. Millions of tons of it have been spread over the fields of the "provinces" for years. And the "men and women who know that this country faces a bright future" under the generative influences of this type of fertilization, have shoveled their dollars into the mails to New York believing that "thrift and intelligent investment are the best way to personal independence and national economic security." The grand crash of '29 was grown in some such manner.

The expounding of this gospel of Fenner & Beane confidence, has been preceded by as noisy and persistent "calamity howling" about the oil industry as has come from all other "calamity howlers" combined. In fact, at times Fenner & Beane seem to be the whole chorus.

"Free Press Agent" material has been issuing from Fenner & Beane's "research department" for some time about the "excessive" oil and gasoline stocks and how they will cut earnings, etc., etc., etc., for quite a howl.

March 25, there appeared in full page space in Barron's Weekly (Dow-Jones financial paper) a full page article signed by a man who connects himself with Fenner & Beane. To analyze the unfair and misstatements and point out all the wrong conclusions in that article would take more space than we can give here. The article shows considerable ignorance of the oil industry and what has been happening in it of late years.

Especially, however, the article bore down hard on the "large stocks of gasoline that are being built up since all attempts at joint control have had to be abandoned owing to enforcement of the anti-trust laws." It talks about "excess supplies constantly seeking a market, drag down the whole price level." The article does not expect any change for the better and it views with great gloominess the prospect of lower earnings for the industry.

The author might well go and learn something about the Madison case.

Then March 28th this same "Research Department" of this same firm of stock brokers, issued a press agent story with more sad talk about "excess of gasoline supply" and "weakness in refined prices" and predicting poorer earnings unless something be done.

We submit, as we have been pointing out these past few months (write for our special booklet "That Mysterious 'Surplus' of Gasoline"—price 25c per copy and well worth it, say I) that these gasoline stocks are being measured against an unknown and unspecified ruler; that the stocks are still safely behind the refinery fences and have not been moved over into the sales departments and offered for sale; that there has been a steady increase in need for more working stocks due to more and larger water terminals, more gasoline pipelines and, so Dow-Jones says, due to 5% more stocks in tanks at service stations the country over. These and other reasons, we urge, seriously question if there is an "excess." Particularly they show that that "excess," whatever it is, is not "on the market" and will not get there until and unless MANAGEMENT of these companies deliberately orders it "on the market." We do not believe management is going to do that because it likes profits as well as any one and besides these increases in stocks are held by companies to whom the increase in inventory is but a drop in the bucket to their finances. But buy that booklet for all the argument.

If the firm of Fenner & Beane are as solicitous of the welfare of the oil industry as it says it is of the whole country and particularly of the savings of its people, it might seem that the firm would take a bit of its own medicine on oil before it became such a calamity howler about the oil business?

The firm's statements about the oil business may quite properly be looked upon as a direct attack on the industry.

Has the firm any interest in common with Messrs. Roosevelt and Ickes and their oil control bill?

May not the oil industry be justified in viewing with some suspicion Fenner & Beane's "calamity howling" just as Messrs. Roosevelt & Ickes, faced with the irate protests of the oil states, seek to make a "concession" which only amounts to cutting the "penalties" but not the "objectives" or scope of the proposed law?

Would a crash in oil prices right now so arouse the oil investors as to make them more susceptible to federal government control by Roosevelt & Ickes?

Or do Fenner & Beane only want a "more active" and "wider" oil stock "market" which would, by reason of more sales of oil stocks, be more productive of stock broker's commissions?

It would seem only fair to ask these questions of Fenner & Beane in view of the continuing adverse comment they have been making on the oil industry and the unfair and even untrue ways in which they have been juggling oil facts and near-facts.

Fenner & Beane might well be reminded that the reason a federal commission is now trying to boss the New York Stock Exchange is just because many of its members tried to run businesses and industries to swell their fees and commissions instead of sitting behind their counters and minding their own business of receiving and selling shares of stocks for the American investor whom they now warn against "calamity howlers" the while Fenner & Beane stir them up against the oil business.

Great Future for Auto Predicted by 'Boss Ket'

WASHINGTON—Success in only a few of the research projects now under way in the automotive industry will give American workmen thousands of jobs and increase the value of the transportation dollar more than can now be realized, said Charles F. Kettering, research vice president of General Motors Corp., testifying recently before the Temporary National Economic (Monopoly) Committee. Lubricants and gasoline he listed as "indispensable engine parts" as are crankshaft and pistons.

"In the field of automotive transportation, with which I am most familiar," Mr. Kettering said, "we are not even predicting when you hear that the next ten years will show a rate of improvement greater than that of the past ten years. This fact is established as clearly as anything in the future can be established. Scores of research projects are now under way in the industries which make automobiles, trucks, buses, tractors, airplanes, and diesel locomotives. This is also true in every one of the industries which make and supply the materials for our industry, such as petroleum, rubber, steel, fabrics, chemicals, etc. . . . .

"Speaking from my own experience, I think particularly of the automobiles of tomorrow, the airplanes of tomorrow. They are being built right now in secluded laboratories by specialists in fuels, metals, ceramics, rubber, plastics—by designers of engines—by petroleum technologists—by others who are devoting their lives to improving such humble but indispensable engine parts as valves and fuel pumps, lubricants and gasoline, for these oil products are now as much a part of the engine design as the crankshaft and pistons."

New Jersey Fuel Oil Group Talks Of 'Free Service', War and Tankers

By N.P.N. Staff Writer

ASBURY PARK, N. J., April 12.—New developments in the European war, with Norway now on the side of the Allies, may double or treble domestic tanker rates, according to C. H. Bruett, Montclair, N. J., of J. Blondel & Son, Inc., speaking at the fifth annual convention of the Fuel Oil Distributors Assn. of New Jersey held April 11-12 here.

The domestic tanker situation and its possible effect on eastern petroleum marketing was one of the principal topics of discussion by convention speakers and in private conversations here.

Mr. Bruett cited tanker rates, the war and other factors as probable influences on next year's fuel oil prices and warned New Jersey distributors against premature judgment in "trying to beat the gun" with contracts to consumers.

If all Scandinavian tankers are interned it might result in a "catastrophe" in the world movement of oil, said Mr. Bruett, who had digressed from his prepared talk on trade associations to discuss war developments.

The U. S. may be called upon to supply most of the war's oil needs, raising another factor to contend with in the next heating oil season, he said.

Hammers at 'Free Service'

In a rousing talk, Frank W. Lovejoy, New York, of Socony-Vacuum Oil Co., Inc., hammered away at the theme that fuel oil cannot be sold by giving free service.

He charged that marketers had caused most of their own troubles the past 4 or 5 years by failing to determine a proper merchandising approach to selling fuel oil and sticking to it. Adding that the supplying companies were equally guilty, he said that too many marketers have overstepped the bounds of "giving."

Fuel oil has progressed from a by-product of gasoline to a primary industry product, Mr. Lovejoy said, pointing out that some refiners sell more fuel oil than they do gasoline.

Increased business of New Jersey fuel oil distributors was not due to the weather alone. He pointed out that temperatures in the state, on a degree day basis, were only 2% below normal, but that the sale and use of burners had increased 13% from the year previous.

Hits 'Free Service'

"You don't get free service on ice boxes or automobiles—why give it on oil burners," asks Frank Lovejoy, Socony-Vacuum, at New Jersey fuel oil convention

'Free Service' Cost Given

The cost of giving free burner service, the Socony executive said, will range from 0.23c to 0.5c per gallon. With present margins, he thundered, "it cannot be done." Free service is not given on ice boxes and automobiles, he pointed out.

He warned that the days of long margins on fuel oils has passed, that the industry would never again see 3c, 2.75c or even 2.5c spreads. To stay in business the marketer will have to know his costs, he added. In fuel oil marketing the cost of delivering, selling, accounting and administration will run to about 1.55c, the speaker declared, emphasizing that these were average costs. If free service is given, he added, it will run the marketer's cost to nearly 2c a gallon. "It cannot be done," he thundered again.

He urged distributors to give their fuel oils a name or a brand. Fifty per cent of the goodwill of a product, he declared, is represented by the distributor himself, 50%, the brand.

"Markets are minds," he declared, adding that marketers should sell fuel oil on the basis of heat units, cleanliness, quick delivery and any other features of the oil and the distributor.

Touching on the war's latest developments, Mr. Lovejoy said, "no one can tell now what effect the war will have on next year's fuel oil prices."

Discusses Transportation

One quarter to one-third of the cost of a gallon of fuel oil delivered to a customer's tank goes for transportation, H. A. Browne, New York, manager, Transportation Department, Shell Oil Co., told distributors, in an outline of water, rail and truck movement of petroleum.

Transportation, he declared is a major problem of Industry in the distribution and sale of goods and to a great extent determines the profitability of any commercial enterprise. This is particularly true of oil, he added, where transportation cost represents so large a percentage of the final cost.

"I firmly believe that there is no more important function in the conducting of a marketing operation today than the efficient and economical transportation of products which the company sells," Mr. Browne asserted.

Sketching a brief outline of the various forms of transportation, he said that "no other type of vessel has developed

Urges War on Anti-Business Propaganda

"If the U. S. is to continue to go forward, it must recognize the honorableness of business," declares Ex-Governor Hoffman, decrying political attacks on industry and urging fuel oil marketers to offset anti-business propaganda

Studerus Re-elected

ASBURY PARK, N. J., April 12.—Ernest Studerus, Kearny, of Studerus Oil Co., was re-elected president of the Fuel Oil Distributors Assn. of New Jersey for the fourth consecutive time here today.

C. H. Bruett, Montclair, of J. Blondel & Son, Inc., was re-named vice president. F. C. Conkey, Elizabeth, of Fuel Oil Supply, Inc., was elected treasurer, succeeding A. C. Lindeman, Newark, of Lindeman Coal Co., who died last Spring. J. F. Hoff, Jr., Princeton, of Princeton Fuel Oil Co., was re-elected secretary. A. W. Rich, Newark, continues as executive secretary.

Harry Renoff, Franklin, of Franklin Petroleum Co. was elected to the board of trustees. Following trustees were re-elected: J. M. Di Bella, Teaneck, of West Shore Fuel Oil Co.; H. A. Isaacs, Jr., Red Bank, of Oil Delivery, Inc.; S. C. Craig, Rutherford, of Craig Fuel Oil Co.; W. L. Yoemans, Plainfield, of Plainfield Lumber & Supply Co.; L. E. Marron, Passaic, of Home Fuel Oil Co.

more than has the ocean tanker . . . they are dependable in almost any weather and make their runs when other vessels are obliged to seek port for safety."

'Country Needs Profit Motive'

"Industry must have the profit incentive if it is going to continue to build the country," Harold G. Hoffman, former governor of New Jersey and again a candidate for that office, told distributors in an address cut short because of a bad throat.

If the U. S. is to continue to go forward, it must recognize the honorableness of business, Mr. Hoffman declared, adding that politicians are not able to tell business how it should be operated.

In recent years, business and industry have become "Public Enemy No. 1," the ex-governor said, suggesting that marketers offset the propaganda being spread that business is reprehensible by telling their children and other children the side of business in the national picture.

Some of the problems studied and solved in the oil industry's burner laboratories were outlined by Stewart H. Hulse, New York, of Standard Oil Development Co., subsidiary of Standard Oil Co. (N. J.)

The work of the New Jersey Standard's laboratory is primarily devoted to the regulation of fuel oil quality and its performance in existing burners, not to the developments of burners as such, he said.

One of the problems they have found, he said, was that of insuring that new domestic burners are installed to give the best possible efficiency as measured by percentage of carbon dioxide and stack temperature.

The speaker outlined the importance of nozzles, draft regulators, smoke, thermostats and line filters to the proper operation of a new burner installation.

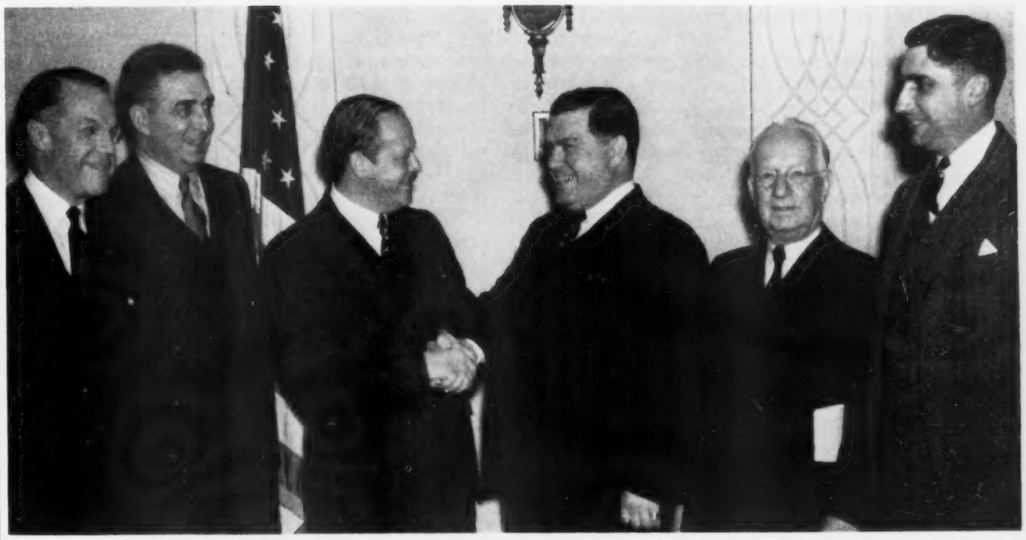
Burner Shipments Up

N. P. N. News Bureau

WASHINGTON—Oil burners shipped in February totaled 11,522 units, compared with 12,963 shipped in January and 7674 in February, 1939, Commerce Department reports. Statistics include data representing about 89% of total value of the industry's output.

At the same time the department reports 15,243 distillate oil burners were shipped in February as against 18,506 in January and 11,393 in February 1939. Data is included for 70 manufacturers for 1940 and 76 for 1939 and 1938. Commerce Department believes coverage is sufficiently representative to show the trend.

Hoffman Congratulates Fuel Oil Group



Ernest Studerus, Kearny, of Studerus Oil Co., association president, is being congratulated by Ex-Governor Hoffman of New Jersey, who is again seeking the gubernatorial nomination on Republican ticket. In the group are, left to right, Frank W. Lovejoy, New York, of Socony-Vacuum Oil Co.; A. W. Rich, executive secretary of the association; Mr. Studerus; Mr. Hoffman; F. C. Conkey, Elizabeth, N. J., of Fuel Oil Supply, Inc., association treasurer; and J. F. Hoff, Jr., Princeton, of Princeton Fuel Oil Co., association secretary

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Socony Sets '41 'Tops' On Fuel, Not Kerosine

N. P. N. News Bureau

NEW YORK, April 15.—Socony-Vacuum Oil Co., Inc., announced that maximum prices in its 1940-41 distributor and consumer contracts for light heating oil in the eastern marketing territory, effective April 15, will be 1.25c higher than "tops" during the season now drawing to a close.

The company revealed, however, that it did not include maximum prices in its contracts to supply consumers with kerosine and range oil.

While Socony said that its contracts are now out in the field in the Buffalo area and New England, and are expected to be offered for signature in New York City area in the near future, other major company suppliers, with the exception of Sinclair Refining Co., marketing in the same areas as Socony were making no moves to announce their contracts. Several, in fact, said, "we're in no hurry."

"We will need more time this year than ever before to consider what basis to place 1940-41 fuel oil contracts," remarked an official of one of the larger eastern marketing companies. He added that there were more factors to consider, war and tanker rates, than there has been in the past ten years. He indicated that his company would not announce their contract terms until sometime early in May.

This indifference to the move of Socony results from the fact that "tops" in contracts Socony is offering consumers are higher than last year. Representatives of other companies point out that, even if Socony desired, there is little likelihood of them wooing their customers with contracts containing higher "tops", at least, until customers find out what their original supplier is offering. Had Socony's contracts reduced the "tops", however, the rush would be on now to get contracts out in the field.

Sinclair Refining Co. reported that its field men are checking to see what prices are offered. It is understood that Sinclair will place its consumer and distributor contracts on the same schedule as announced by Socony, in the area where the latter markets.

The hesitancy of other companies to announce their intentions, however, is believed traceable to several factors, paramount among which is the unsettled boat market. As discussed in other columns in this issue of N.P.N., some marketers feel that anything can happen in the boat market, and they prefer to await developments before committing themselves for the 1940-41 season. Indications here, however, are that other companies marketing on the eastern seaboard would announce the details of their contracts before the end of the month.

Considered Abandoning 'Tops'

In announcing its new contract provisions, Socony admitted that it had given consideration to the abandonment of "tops" in its contracts for light burner oils as it did for kerosine.

In late January and early February of this year, when the eastern fuel oil industry was called upon to supply a record amount of fuel because of the severely cold weather and the increased use of this product, some fuel oil men said they favored contracts without maximums for future marketing.

Commenting on its feeling toward "tops" in next year's contracts, the Socony announcement said:

"For a time the company thought it might have to follow the same course it had pursued in connection with kerosine, namely, abandon setting a maximum price en-

tirely because of uncertain conditions including among others, possible rises in cost factors."

Despite conversation in the east of possible $1.50 to $2 boat rates—because of war developments and the improved outlook for exports which prevails in some quarters here, Socony evidently believes the "tops" placed on its contracts will be sufficient to cover all "rises in cost factors" which it recognizes in its statement. Explaining the continuation of "tops" on light fuel, the announcement added: "However, the company decided, in the interest of its contracted consumers, it would be preferable to establish a maximum for the coming year even though the price may not actually reach this level."

The following list of representative cities in the eastern area where Socony operates, gives a good indication of the difference in contract "tops" in the 1940-41 agreements, compared with tops in current contracts:

	Tank Wagon Consumer Contracts		Tank Car Distributor Contracts	
City	1940-41	1939-40	1940-41	1939-40
New York	7.7	6.75	5.8*	4.75
Boston	7.9	6.75	6	4.75
Albany	7.9	6.75	6	4.875
Buffalo	8.2	7.75	6.2**	6
Portland, Me.	8	6.75	6.1	4.875

*Barges. **Delivered.

Spread Not So Wide

While the 1940-41 contracts are higher than for the current season, they do not have as wide a spread between the prevailing tank wagon and barge and tank car prices as the 1939-40 contracts did at this time last year.

Using New York City as an example—at the end of March, 1939, or just before the 1939-40 contracts were announced last year, the low of the tank car price for light fuel in New York was 3.75c, while the consumer tankwagon price was 5.75c. Maximum prices in contracts announced at that time were placed 1c above these prices; 4.75c for distributors and 6.75c to consumers.

Current barge price (Socony discontinued its tank car price) for New York is 5.30c, with a top for the coming season of 5.8c. This is a spread of 0.5c, compared to a full cent a year ago. The present New York city tankwagon price for light heating oil is 7.30, while the maximum in next year's contract is 7.4c, or 0.4c higher.

However, one of the principal factors affecting eastern petroleum markets—tanker rates—are considerably different this year than they were a year ago.

Despite the fact that eastern suppliers generally placed a 1c margin between the price at time of contract signing and the "tops" in the contracts, the combination of all-time high tanker rates, the oil field shutdowns, the European war, and extremely cold weather and heavy demand for oil caused consumer tankwagon prices to rise 0.55c above the tops in consumer contracts, or 1.55c above the price in effect at contract signing last year.

Present boat rates—the last fixture reported was at about 70c per bbl. for light fuel, are 1.1c per gal. above the rate (17c per bbl.) from the Gulf to New York which prevailed at this time last year. Excluding the rise in tanker rates, the tankwagon price in New York at its peak was actually 0.55c below the tops of last year's contracts.

Coal Prices Fixed To Meet Fuel Oils

N. P. N. News Bureau

WASHINGTON, April 15.—Soft coal prices competitive with imported fuel oil sold in New England were proposed today by Bituminous Coal Division, Interior Department, in report recommending minimum mine prices for soft coal shipped into Northeastern Territory. Report stated:

"As American coals shipped into the New England markets must compete with imported fuel oil from foreign countries, the examiners recommended prices which would reflect this competition and permit U. S. coals to be sold there."

The New England prices suggested by the examiners "generally approximate the present rates," the "recommended minimums average about 14 cents a ton less than the prices established by the old National Bituminous Coal Commission in January, 1938, and, they are approximately 9 cents per ton less than the minimum prices established under the NRA Bituminous Coal Code."

5 More Lines Valued by ICC

WASHINGTON, April 15.—Release of final valuations by Interstate Commerce Commission on common carrier properties of five pipeline companies brought Commission valuation work on pipelines to about 90% completion, Ernest I. Lewis, Valuation Director, declared here today.

Out of a total of 75 pipelines to be valued, so-called final reports have been issued for 51 companies covering about 94% of total pipeline capacity. Following issuance of a final report the valuation process is resolved into a book-keeping matter of recording additions, betterments and retirements, etc.

Reports released this week covered the following properties as of Dec. 31, 1934: Magnolia Petroleum Co., $41,500,000 for owned-and-used property and $1,317,500 for property owned-but-not-used, and $93,680 for leased properties; Pure Transportation Co. $5,800,000 owned-and-used properties, $892,000 for property owned-but-not-used and $16,363 for leased property; Southern Pipe Line Co. $1,350,000 for owned-and-used property, $60,509 property owned-but-not-used and $693 for leased property; South West Pennsylvania Pipe Lines $2,700,000 for owned-and-used property, $230,000 for property owned-but-not-used and $35,533 for leased property, and Indiana Pipe Line Co. $2,725,000 for owned-and-used and $325,016 for owned-but-not-used property.

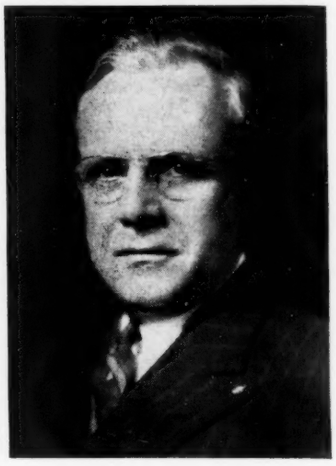
Gulf Refiners Report Stocks

HOUSTON, April 16.—Gulf Coast Refiners Assn. membership reported cuts totaling 206,258 bbls. in stocks of most light and heavy fuel oils the two week period ending March 31, according to report issued by G. C. R. A. Inventory of Grade C. fuel dropped 95,901 bbls. during the period with slight increase in Diesel Gas oil stocks reported.

Crude runs to stills were reduced a daily average of 2,165 bbls. during the two week period, but gasoline stocks increased 73,523 bbls., the report said.

Kerosine stocks standing at 75,552 March 31 were 21,280 bbls. below March 15 stocks. Diesel gas oil stocks at 244,609 bbls. were up 25,869, burning oil inventory at 537,051 were down 60,167, No. 5 stocks at 322,593 bbls. were down 28,910, and Bunker C. stocks at 281,047 bbls. down 94,901.

Ray G. Whipple Heads Oil Burner Institute



Ray G. Whipple

NEW YORK, April 15.—Ray G. Whipple, Harvey-Whipple Inc., Springfield, Mass. was elected president of the Oil Burner Institute at the annual meeting in Buffalo, April 2, to succeed Frank H. Dewey, Gar Wood Industries, who held the office for the past two years. Other officers elected were, First Vice-President, E. P. Bailey, National Airoil Burner Co.; Second Vice-President, J. H. O'Brien, Petroleum Heat & Power Co. and Secretary-Treasurer, C. F. Curtin.

Mr. Dewey, as retiring president, reported that membership was stronger in numbers and influence than ever before, and that the Institute's budget was balanced.

Attention was given to adverse legislation and the new licensing and bonding law in New York City was discussed at some length. Funds were voted for a study and interpretation of this bill and steps to be taken will receive the immediate attention of the Executive Committee and the Legislative Committee.

It was announced that the next regular quarterly meeting of the Board of Directors will be held in July at Eastern Point, Connecticut.

Atlas Reorganization Studied

SHREVEPORT, La., April 15.—Reorganization plans for Atlas Oil Corp. are to be considered here this week before Federal District Judge Ben C. Dawkins. Several plans had previously been considered, but rejected. It was believed one of these rejected plans might possibly be revamped and eventually receive necessary approval.

Oil Transportation News

Latest developments in freight rates, legislation, regulations, and new construction affecting transportation of petroleum products by truck, barge, tanker, pipeline, and railroad.

Trucker Sues Rails, Asks Treble Damages

ATLANTA, Ga., April 13.—Southern railroads were the target of another "conspiracy" charge last week, this time by a Florida oil transporter who alleged that the rails were planning "truck destructive" rates on petroleum products in the South and Southeast.

Rails were charged with conspiracy to violate federal anti-trust laws earlier this year for alleged interference with construction of Southeastern Pipe Line Co.'s pipeline from the Florida Gulf coast to southeastern destinations.

Pending in North Carolina now also are two treble damage suits by oil truckers against certain railroads in that state, charging a "conspiracy" to eliminate truck competition. One of these North Carolina suits, filed by D. C. Patterson, is due to come up for trial May 27; the other, by Quality Oil Transport, has been pending since the 1935 rate cuts but is now slated for trial at the May term. Both are docketed in superior court for Alamance county.

Petroleum Carrier Sues

Southern Railway Co. and Atlantic Coast Line Railroad Co., together with other members of the Southern Freight Assn., are charged by Petroleum Carrier Corp., Jacksonville, Fla.—one of the country's largest transporters—with conceiving a "scheme and plan calculated and intended to destroy and eliminate plaintiff and other for-hire motor carriers of bulk petroleum products as competitors", according to the complaint.

In furtherance of the alleged scheme, the trucker charged rails "unlawfully combined" and conspired to adopt "truck destructive" petroleum rail rates. In so doing rails were charged with:

(1) Mutually undertaking an investigation of truckers' contract rates and their minimum operating costs, (2) discussing with southeastern major oil company representatives the maximum and minimum rates to be put into effect by rails to "capture and take over all transportation" of petroleum products and to destroy competition of plaintiff, (3) appointing a committee to suggest "truck destructive" rate schedules, (4) purposing "upon accomplishment of their unlawful scheme, to increase rates to the profit and gain of said rail carriers and great loss to the shipping public."

After making the conspiracy charges, the trucker requested that the federal district court here restrain rail defendants from further agreeing and conspiring to "monopolize the transportation" of petroleum and from driving plaintiff out of business.

Rails are ordered to answer the complaint within 20 days.

Rails 'Shocked' by Suit

"Railroads are shocked at the charges brought by the trucker," a railroad spokesman for the railroads told NATIONAL PETROLEUM NEWS. "This trucker is hauling us into court for trying to find a set of petroleum rates that will prevent us from losing our entire petroleum tonnage into the Southeast to the pipelines," he added.

Then he explained how the rails, fearful of losing business to the pipelines, had called on shippers for their ideas as to how to meet this "potential competition". Then followed open hearings on the proposed rates, none of which has yet been put into effect, he said.

"We are determined not to lose that southeastern business," one rail official has said, "and I don't believe we'll stand by and let it trickle through our fingers."

Rails Go Ahead With Rate Cuts

By Telegraph

ATLANTA, April 15.—Two southeastern railroads have announced that they will reduce freight rates on petroleum products by as much as 6c per cwt. (0.396c per gal. on gasoline) from Savannah and Port Wentworth, Ga., to Georgia destinations. Representative of the proposed rates on gasoline are shown below:

	Present	Proposed
Atlanta	1.650c	1.254c
Rome	1.914c	1.518c
Dalton	1.914c	1.650c

A for-hire oil trucker last week filed an anti-trust suit in federal court against Southern Freight Assn. and several specifically-named railroads, charging a "conspiracy" to drive oil transporters off the road. List of defendants, however, did not include the 2 carriers who have announced the rate cuts, although they, too, are members of the S.F.A.

Rail executives said it was "almost inevitable" that rates from other South Atlantic and Gulf terminals into the Southeast would be reduced in line with proposed reductions to Georgia points.

Local Rates Apply To Iowa Shipments From Pipeline Tank

TULSA, April 15.—Decision by Iowa State Commerce Commission holding that gasoline shipped from a Des Moines pipeline terminal to Preston, Iowa is intrastate commerce conforms with precedents in other states, according to interpretations here.

Iowa commission decided that interstate movement ceased when the gasoline delivered by the Great Lakes pipeline was co-mingled with other gasoline and stored at the Des Moines terminal. Therefore any reshipment of gasoline from the Des Moines terminal to Iowa points constituted intrastate delivery and as such is subject to Iowa state laws and take the intrastate rail rate, the commission ruled.

The Iowa commission's decision was handed down in complaint against Chicago, Milwaukee, St. Paul and Pacific Railroad Co. by Alvin H. Krumviede, Iowa marketer, who was represented by Eugene L. Orvis.

Young Heads Transport Study

WASHINGTON — A long-range study of the national transportation problem will be undertaken by a committee, headed by Owen D. Young, former chairman of the board of General Electric Co. at the request of President Roosevelt. Other members have not been named as yet.

Shreveport Demands Same Rate Proposed For El Dorado, Ark.

NEW ORLEANS, La., April 15.—Opposition to reduced rail rates on petroleum products shipped from Baton Rouge, New Orleans and El Dorado, Ark. to Tennessee river points in northern Alabama and southern Tennessee may crystallize into a request that Interstate Commerce Commission investigate and suspend the new rates scheduled to take effect May 13.

This threat was voiced at an ICC hearing here last week on application by Shreveport, La. refiners that they be included in the schedule of reduced rates.

Shippers from Shreveport stressed the close relationship between Shreveport and El Dorado as refining centers, pointing out that they had the same common crude sources and markets. Exclusion of Shreveport from the rate cut would place refiners there at a decided disadvantage, they said. This disadvantage was evaluated at as much as 23c per cwt. (1.518c per gallon on gasoline) to some destinations.

One El Dorado refiner said he objected to widening the scope of the cut to include Shreveport.

Rails testified that the reduced rates were compensatory.

European War Events Worry Tanker Market

(*Continued from page 9*)

Germany grabbing these vessels. There have been reports of "phoney" orders to Norwegian ship captains dispatched from ports now occupied by German troops.

Another question was: "What would the British do with the tonnage after they take over?"

Reports here are nearly divided as to whether the Allies had sufficient tanker tonnage, or whether they had been short.

If they had a surplus of bottoms, it is quite probable that they would prefer to have these vessels out earning dollar exchange. Planes and other war supplies do cost money.

While Britain and France might have more than sufficient tonnage to operate under normal conditions, the slow and uncertain movement caused by the war has resulted in the Allies needing more bottoms, is another view. If so, the answer to their problem would be to take over the entire Norwegian and Danish fleets.

American companies who have some of these boats under time charter, and foreign shippers who have been using Norse bottoms will have to look for other methods of transportation—which virtually means American-flag boats.

Sees Higher Rates

One owner of American-flag tonnage said in his opinion rates could not help but be sharply higher, probably double present rates if the above were to become an actuality. He adds, that even if Norwegian owners are allowed to continue to operate their boats, higher war risk insurance rates, and the possibility that owners would take advantage of war clauses in time charter contract to cancel and seek higher rates, would result in many of American-flag boats leaving the coastwise trade.

Probably a criterion of future rates for domestic movement of petroleum products from the Gulf to North Atlantic ports is the action of the boat market following the outbreak of war in September. Rates were in the doldrums during the summer of last year, fluctuating between 14.5c and 17c per bbl. for light heating oil. However, in the 4-month period following the outbreak of hostilities, rates jumped 325% reaching all time highs of 67c for gasoline and 73c for light heating oil. While they have been easier in recent weeks, they still hold to prices near the all-time highs.

This jump in rates resulted in adding 1.1c per gallon to the laid down cost of fuel oil at New York, from prices early in the summer to the peak reached in February.

Many oil men at the outset of the war in September believed that demand for oil in the American Gulf would cause a realignment of supply for domestic markets. But the war failed to live up to the name. Oddly enough, this is a distinct possibility now, oil men here believe, despite the fact that exports of petroleum from the Gulf are down.

One company is bringing oil from the Middle West, to the backdoor of the New York Harbor market—up along the New York state Barge Canal. Another company with refineries in the east is bringing Illinois crude to the Seaboard to be refined here.

Gulf Refiners Show Anxiety

By Telegraph

HOUSTON, Tex., April 16.—Shipments of crude oil and heavy residuum from Gulf Coast ports in export trade will be the hardest hit by the virtual elimination at this time of Norwegian and Swedish boats from the shipping picture.

One refiner on the Gulf Coast said he had 140,000 bbls. of heavy residuum sold for export, but Swedish and Norwegian boats have been ordered to stand by, refusing to load the cargoes.

"We've been carrying peak stocks for six months now and when they take away virtually our only avenue of movement, that makes it tough," one refiner said. He reported that frantic attempts to obtain information on future status of Scandinavian boats had been unsuccessful. "No one knows what the outcome will be," he added.

One Texas Gulf Coast refiner reported that unless Norwegian and Swedish boats resume normal operations within 10 days, he will be forced to close his refinery for a month.

Production of crude oil from Gulf Coast field that normally moves in export trade is expected to be cut back temporarily, according to some reports. "We may have to ask the Texas Railroad Commission to curtail allowable production in some fields until we get some relief," one export seller said.

Unconfirmed reports were that navicerts on petroleum movements via Norwegian boats to Italy have been cancelled out.

Shell Plans 85-Mile Line

ST. LOUIS, April 13.—Shell Oil Co., Inc., plans a new, 85-mile gasoline pipeline from Fall River, Mass., to Waltham and West Boylston, Mass. Construction bids will be opened April 18 in New York. Work is expected to start early in May and be completed in about 3 months.

The line will be built of 6-inch welded pipe, and will be protected by an asphalt and paper wrap in places indicated by soil surveys. It will have a capacity of 10,000 bbls. per day, and its initial daily load probably will be about 7500 bbls. It will transport gasoline, kerosine, fuel oils, and other refined products.

From Fall River, the new pipe line will run 40 mi. in a northerly direction to a point near Sherborn, where it will branch, one leg going to West Boylston and another to Waltham, suburbs of Worcester and Boston, respectively. There will be one pumping station at Fall River, where the line connects with a Shell products tank farm.

Products to be handled through the line will be transported to Fall River by tanker from the Shell refineries at Houston, Texas, and Norco, La.

Hull Squelches Report Of Switch to U. S. Flag

N. P. N. News Bureau

WASHINGTON, April 13.—That Administration's foreign policy bars any move now to transfer American-owned-or-controlled tankers from Norwegian or Danish registry to U. S. documentation was indicated here today by Secretary of State Hull.

Government sources here said:

1. That foreigners are barred by law from documenting ships under the U. S. flag.

2. That ships now under foreign registry which are owned or controlled by U. S. citizens* may transfer to U. S. registry by conforming to existing navigation laws provided such transfer now does not raise a question of foreign policy.

Bureau of Marine Inspection and Navigation regards such transfers by U. S. citizens, as involving foreign policy and is bound by State Department's attitude notwithstanding shipping act provides for such transfers upon meeting prescribed conditions. Maritime Commission handles registry transfers from U. S. to foreign flags while Bureau handles transfers to U. S. registry.

The law prohibits all foreign-flag vessels, whether or not controlled by American citizens, from entering U. S. coastwise trade. American-built vessels, sold to aliens or registered under foreign-flag, may possibly be transferred to U. S. registry but even so the vessels cannot enter domestic coastwise trade.

Hull States Views

Administration's policy was indicated by the Secretary of State in response to an inquiry by NATIONAL PETROLEUM NEWS as to the State Department's attitude in the light of widespread reports of pending shifts tanker registry to U. S. from Norse and Danish flags. The Secretary said he knew of no move afoot to effect such transfers, that the department's attitude would depend upon different factors that would arise, but that he had in mind no proposed transfer which would be looked upon with any special favor.

Both the Danish and Norwegian embassies here have denied there is any movement afoot to transfer to U. S. flag registry. They point out that such a transfer would bar them from the combat zone, under the U. S. Neutrality Act, which now includes their home waters.

*The term "citizen" under U. S. shipping and maritime laws, as applied to corporations, means corporations organized under laws of a state of the U. S. To engage in foreign commerce under U. S. registry, 51% of the control of such a corporation must be owned by U. S. citizens; 75% control is required of corporations owning vessels operating in U. S. coastwise trade which includes intercoastal, inland lakes, waterways, etc.

Hull Uses Strong Language In Note to Mexico on Oil

N. P. N. News Bureau

WASHINGTON, April 15. — The taking of property without "adequate, effective and prompt compensation is not expropriation, but is confiscation," the State Department reiterated in its note of April 3rd to the Mexican Government requesting arbitration of the controversy over seizure of U. S. oil lands in Mexico. Note admitted there is no present prospect of payment.

Publication of the note disclosed Secretary Hull's language was firm in his recapitulation of the U. S. grievances against Mexico not only in the oil grab but on other unsettled issues of many years standing.

Contention of the Mexicans that there is "no divergence of views" between the two countries on expropriation was rejected outright by Hull. "It is no less confiscation because there may be an expressed intent to pay at some time in the future," the Secretary of State wrote.

Dispatch of the note to Mexico that hope of oil companies negotiating a satisfactory settlement with the Mexicans has evaporated. Secretary Hull said Mexican Government has at various times "indicated its ability and readiness to pay. But the fact remains that no payments have been made."

Two Avenues Suggested

Secretary Hull suggested that the two governments agree:

"(1) to submit to impartial arbitration all the questions involved in the oil controversy and to clothe a tribunal with authority not only to determine the amount to be paid to American nationals who have been deprived of their properties, but also the means by which its decision shall be executed to make certain that adequate and effective compensation shall promptly be paid, and

"(2) either to submit to an umpire, as contemplated by the general claims protocol of 1934, the unadjudicated claims falling under the convention of 1923, or proceed immediately to the negotiation of an en bloc settlement in accordance with that protocol."

The note also stated that with "submission to arbitration of the oil controversy and the adjustment of the general claims matter, the two governments would then be in a position to go forward" with the negotiations for a general settlement of all other pending matters.

State Department made it plain that the U. S. note had nothing to do with the British claims for expropriated oil properties.

30 Refiners Adopt New Octane Bracket

TULSA, April 15.—Thirty refiners in the Mid-Continent who quote motor fuels in the open spot market have adopted the new Western Petroleum Refiners Assn. octane brackets with octane rating determined by the A.S.T.M. test method.

This leaves only one refiner of any size in the field—a refiner in the Arkansas refining district—who has not made the change to the new classifications. Reports from that refiner late today indicated he would make the change April 16 or 17.

A breakdown of the total number of refiners now using the new brackets shows they are distributed as follows:

Oklahoma	13
North Texas	6
West Texas	2
East Texas	1
Kansas	5
North Louisiana	1
Panhandle	2
Total	30

There are also a number of refiners in the Mid-Continent who do not quote in the open market who also have adopted the official W. P. R. A. classification and test method.

More Recycling Plants Started in Grapeland

HOUSTON, Tex., April 10.—Two recycling plants are under construction in the Grapeland field and a third will be enlarged within the next few weeks.

American Oil Co. is increasing the capacity of its plant from 20,000,000 cubic feet to 40,000,000 cubic feet daily.

Lone Star Gasoline Co. and Trinity Gas Co. are completing construction of a plant with a capacity of approximately 70,000,000 cubic feet daily.

Grapeland Oil Co. has started laying gathering lines preparatory to construction of the third plant.

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New Wage-Hour Rules Proposed By Oil Men

N. P. N. News Bureau

WASHINGTON, April 15.—Broadening of definitions under the federal wage-hour law exempting certain employes in the wholesale distributive trades was discussed pro and con in hearings here this week before Harold Stein of the Labor Department's Wage and Hour Division.

The hearings, which will be concluded this week concerned redefining of the terms "executive," "administrative" and "outside salesman" as determining employes exempt from the minimum wage and maximum hours of the federal law.

Oil industry representatives attended the sessions but, in the main, did not offer concrete proposals at the hearings feeling broadening requested by the general wholesalers would overcome, if adopted, any objections they have to the present terminology. Two oil organizations, Shell Oil Co. and Mid-Continent Oil & Gas Ass'n. proposed revisions.

Labor union opposition against broadening the present terms alleges that to do so would virtually exempt all "white-collar" workers. Issue boiled down to the proposition at the hearings of wholesalers pointing out that under present definitions the language takes in many workers not within the class of workers intended to be covered by the act while excluding others it was intended to include.

Definitions Are Not 'Fixed'

It was made clear by the presiding officer, Harold Stein, at the opening of the hearings that the definitions are not fixed or absolute. The matter is an administrative one, he emphasized, and subject to informal procedure such as handling by correspondence with wholesalers or industry members concerned.

Although "professional" employes were included in the hearing, oil industry interest went only to the executive, administrative and outside salesman angles. Industry spokesmen, in general, asked and were permitted to file statements with the Wage-Hour Division later. All statements relating to the matter, Division announced, must be filed by May 1.

The wage and hour law exempts "any employe employed in a bona fide executive, administrative, professional . . . or in the capacity of outside salesman." The terms were defined by the Wage Hour Administrator to mean, roughly, employe whose primary duty is management of establishment or recognized department, one who directs work of others, who has "hire and fire" authority, who exercised discretionary powers, who does "no substantial amount" of work of the same nature as performed by non-exempt employes, and who is paid "at not less than $30 (exclusive of board, lodging, or other facilities) for a workweek."

Shell Oil's statement pointed out that "Congress did not use the words 'executive' and 'administrative' synonymously, but rather intended each word to signify a separate classification."

According to Shell, "The present definition which jointly defines the two words may perhaps be satisfactory in the case of a small business employing less than one hundred employes, where all of the attributes of an executive or administrative employe may be embodied in only a few persons, but is almost wholly inadequate in its application to a widespread business employing thousands of employes in many locations through the entire U. S. under circumstances where the executive attributes are necessarily divided into lesser and lesser degrees so that ultimately for the purpose of efficient operation and organization, the various attributes are seldom combined in any one employe. Yet, that designation should carry over to any employe who shares one or more of the attributes of an administrator for to that extent he carries the dignity and prestige of the employer as a badge of authority which sets him apart from his fellow employe. The use of discretion is perhaps the outstanding attribute of an administrative employe.

Discusses 'Outside Salesmen'

"The present definition of 'outside salesman' is much too narrow except where outside sales activities are all centered in one person. In larger sales operations, different phases of salesmanship are handled by specialists who could not possibly become expert in every phase including the closing of the sale, yet whose time is spent in major portion away from his employer's place of business and under no direct supervision, who is responsible for results only and whose time is at his own disposal."

The Shell company's proposed substitute on "executive and administrative" employe would raise the weekly wage minimum to $35 instead of $30 per week and exempt any "who customarily and regularly assists the executive in putting into effect the policies and managerial authority of the employer, and who customarily and regularly exercises discretionary powers, and "whose principal responsibilities are dissimilar to those of non-exempt employes."

Definition Proposed

"Outside salesman" would be redefined by Shell to mean any employe who customarily and regularly performs the major portion of his work away from his employer's place of business, or who is customarily engaged in making sales or sales promotion activities, etc.

Mid-Continent Oil & Gas Assn. proposed "and administrative" be excluded from the "executive' definition and the term be held to exempt those making "not less than $30" a workweek, and those with power to bind employer, control employer's goods, or who is customarily engaged in work as to which employer is interested only in "results obtained," and requiring consistent exercise of discretion, and where time required for output cannot be foretold, or who performs work "immediately incidental to" work of any employe exempt as an executive, professional, or other administrative employe.

Oil Representatives Present

Oil industry representatives present at the hearing included C. L. Harding for Shell Oil Co. Inc., Raymond M. Myers for Mid-Continent Oil & Gas Assn., Albert E. Van Dusen for Texas Co., Luke W. Finlay for Standard Oil Co. of N. J., Mr. Brown for Standard Oil of Kentucky, James E. Dyer, E. H. Mutz and Joseph P. Walsh for Sinclair Refining Co., and M. C. Mallon, National Petroleum Assn.

Southern States Industrial Council in behalf of its wholesale members suggested that term "administrative" embrace: "Clerical employes such as bookkeepers, payroll clerks, auditors, cost accountants, statisticians and all other office help regularly employed on a straight salary basis and given vacations and sick leave with pay. CIO and AFL unions object to this proposal as opening the door to widespread exemptions.

The Teamsters Union (AFL) opposes revision of "outside salesman" definition.

'Gas' Stocks Show First Drop in '40

By Teletype

NEW YORK, April 16.—Gasoline stocks for the country as a whole started on the down grade the week ended April 13, with a cut of 108,000 bbls. in inventory of this product, according to a report of refinery operations by the American Petroleum Institute today.

Crude runs to stills at U. S. plants were increased 115,000 bbls. on daily average during the week. Gasoline production increased 268,000 bbls., the Institute report shows.

Germany Makes 'Gas' from Coal

N. P. N. News Bureau

WASHINGTON, April 15.—Germany is producing approximately a billion gals. of gasoline annually from coal, and some reports put the yearly production at more than 8 billion gals., according to American Mining Congress.

No actual figures are available as to present cost per gallon but in 1937 Germany was producing this gasoline at between 21c and 25c per gallon. Minimum cost is placed at 18c per gallon in government circles here.

Such gasoline comprises about 35% of Germany's annual consumption, the Mining Congress reported.

MINNEAPOLIS, April 15.—Petitions, carrying 30,000 signatures, to place a constitutional amendment to prohibit diversion of highway funds on the North Dakota ballot have been referred to the attorney general of the state for approval, Northwest Petroleum Ass'n. bulletin reports.

Socony Buys 60 Stations

KANSAS CITY, Mo., April 15.—The White Eagle Division of Socony-Vacuum Oil Co., Inc. has purchased Shell Oil Co.'s bulk plants at Kansas City, Independence, Mo. and Olathe, Kans. and the 60 service stations serviced from these three plants, a Socony-Vacuum official said.

"We were doing lots of bulk plant business in this area and the 60 stations fit into our marketing picture," the official added.

No decision has been made as to how the new stations will be operated. They will be supplied petroleum products from Socony-Vacuum's pipeline terminal here, it was said.

Natural Gasoline Association Lists Papers for Convention

TULSA, April 15.—The latest technological trends in the processing of natural gas and the manufacture of natural gasoline will be featured at the nineteenth annual convention of the Natural Gasoline Assn. of America. The convention will be held in Tulsa, May 15, 16 and 17.

Liquefied petroleum gases are becoming by-products of increasing importance. Two papers will deal extensively with those products. One paper, titled "New Test Methods and Specifications for Liquefied Petroleum Gases," will be given by C. R. Williams, Continental Oil Co., Ponca City, Okla., who also is chairman of the association's technical committee. The paper will present the new tentative standards for these products and review other activities of the committee.

Just what it means in the way of economics for natural gasoline plants to attempt a more thorough job of extracting the butane and propane from natural gasoline will be discussed in another paper. The title is "The Economics of Liquefied Petroleum Gases." It will be given by J. A. Vaiden, Skelly Oil Co., and will explain what the manufacture of these by-products of a natural gasoline plant represent in terms of additional investment, operating cost and marketing expense.

Recycling Developments

There is another trend in natural gas processing that is holding the attention of the industry at the present time, That is the technique of recycling of gas to maintain pressure in crude oil producing formations. This development has been quite extensive on the Gulf coast, and the operation has had to be carried on in the face of exceptionally high pressures.

E. E. DeBach of the Corpus Christi Corp., will discuss "Developments in Gas Recycling Plants." In the paper he will review the mechanical developments, including high pressure absorption.

This paper will be followed by one by Dr. George G. Brown of the University of Michigan, entitled, "The Measurement of Gas Flow under High Pressure." Dr. Brown will present a method for simple calculation of the deviation from Boyle's law of high pressure gaseous mixtures based on the application of theoretical data to actual field measurements.

There is a conservation angle to the recycling operation, and H. B. Bernard, Tulsa, will discuss "The Position of Natural Gasoline in Conservation," in which he will tell of the value of natural gasoline operations to the producer, the oil industry and the nation.

'Newest' In Aviation Fuel

The widely discussed "newest" in aviation fuels will be discussed by R. C. Alden, Phillips Petroleum Co., in his paper, "Neo-Hexane, the Fuel of Tomorrow." He will tell of the combination of alkylation of light paraffin hydrocarbons such as ethane, propane and butane with olefins to produce neo-hexane, an iso-paraffin, high octane number, aviation fuel.

Contracts and testing methods are always problems for the association and will be discussed again at the convention. James E. Allison, Hanlon-Buchanan, Inc., and chairman of the gas contract committee, will discuss "The N.G.A.A. Standard Form of Casinghead Gas Contract." H. E. Oder, Cities Service Ool Co., and chairman of the gas testing committee, will present in his paper, "Revised Charcoal Method for Testing Gas," a modernized tentative version of this field method for determining the gaoline content of natural gas.

E. G. Hammerschmidt of the Texoma Natural Gas Co., will discuss in his paper on "Elimination of Hydrate Troubles," a review of present successful methods for dehydration of gas and outline the relative merits of various treating agents.

Operating Kinks

The "Operating Kinks" session will fill one day of the convention. The operating kinks will be presented and described by the men who have worked them out in order to save time and expenses at plants. The customary number of prizes will be awarded.

The Hanlon Award will be presented at the Thursday morning session to the individual chosen by the committee for outstanding service to the natural gasoline industry during the past year.

By ALLEN S. JAMES

Around The Mid-Continent

Col. Thompson Runs for Congress Seeking Texas Panhandle Seat

Col. Ernest O. Thompson has jumped out of the governorship race in Texas and now is aiming at a place in Congress.

The nationally-known Texas railroad commissioner and oil conservation authority is going to seek the congressional seat left vacant when Rep. Marvin Jones resigned recently to become a member of the U. S. Court of Claims.

Col. Thompson ran second to Gov. Lee O'Donnell 2 years ago when the flour mill representative from Fort Worth made election history with his hill-billy band and "pass the biscuits, pappy" phrase. Thompson has been runnning again this year just as hard as he could, but had not made formal announcement of his entrance into the race. That announcement was scheduled for May 1.

But when Jones resigned, that changed matters, and Thompson, after a trip to Amarillo, where he once was mayor, announced he was going to make the race for Congress.

That announcement changes what otherwise would have been an interesting phase of the governor's race to watch. Commissioner Jerry Sadler, freshman member of the oil regulatory body, already had announced he was a candidate for governor, which would have given the Texas voters the opportunity of seeing two members of the same regulatory body after the same office.

* * *

Dam Won't Halt Oil Field, Says Army Engineer

There is nothing to worry about as far a an oil field in the Denison dam basin area is concerned, according to Capt. Lucius D. Clay, chief of Army engineers in charge of the huge project on the Red river near Denison, Tex.

Capt. Clay told a civic club at Durant, Okla., recently that "The dam will be completed according to original plan. However, there is a possibility of delay in filling the power pool of the reservoir and the development of power. Such delay probably would be for such time as required to develop the oil field."

The Pure Oil Co. recently brought in a good well in Marshall county, with indications there is a good field there. Complete filling of the proposed reservoir would inundate the prospective field.

Gov. Leon C. Phillips of Oklahoma has been fighting the construction of the dam, and when the oil well was discovered he grabbed it as another weapon with which to fight the government's project.

The Army engineer said that it will require 4 years to construct the dam, and an additional year to fill the reservoir. By that time, he said, the oil field may be fully developed or so far exploited as to determine its size. If the reservoir is filled only to flood control stage, he said, little of the oil structure would be affected. "If there still is drilling activity in the area when the dam is completed, we simply can keep open the power outlets and delay development of power until the oil field is developed."

'To Tell All the Truth'

While on Texas politics, it is interesting to note that Gov. W. Lee O'Daniel, who undoubtedly will be a candidate again this year, is going to start a weekly newspaper of his own that will "tell all the truth and facts."

The governor says some Texas newspapers have not been so inclined, that some of the radio stations have cut him off the air. So he's going to be his own publisher, and is asking for subscriptions to his proposed paper.

And up popped Thompson with the statement that he had never found the newsapers of the state anything but fair and truthful and that he had never been misquoted in all the time he had been in public office. He added that occasional newspaper criticism of public officials is good for them.

Latest Oil Industry Statistics

Trends of Basic Figures

	Apr. 13, 1940	Apr. 6, 1940	Apr. 15, 1939
Crude Production (*Bbls. daily*)	3,853,800	3,745,000	3,494,500
Crude Imports (*Bbls. daily*)	98,428	107,700	403,000
Crude Runs to Stills (*Bbls. daily*)	3,570,000	3,455,000	3,330,000
Gasoline Stocks (*Bbls. total*)	101,945,000	101,690,000	87,071,000
Gas Oil & Distillate Stocks (*Bbls. total*)	24,237,000	23,551,000	20,722,000
Residual Fuel Oil Stocks (*Bbls. total*)	102,595,000	105,099,000	103,076,000

Crude Oil Production for the U. S.

(American Petroleum Institute figures)

	Week Ended Apr. 13 Barrels	Apr. 6 Barrels	Mar. 30 Barrels
Oklahoma	400,850	413,300	402,050
Kansas	176,400	175,350	180,400
Nebraska	.....	.....	.....
Texas	1,494,500	1,394,450	1,510,800
Louisiana	286,750	382,700	281,700
Arkansas	68,900	69,250	69,000
Mississippi	7,650	8,500	7,850
Illinois	421,750	425,800	426,950
Indiana	8,350	9,750	8,500
Eastern (Ill. and Ind. excluded)	97,150	96,750	96,300
Michigan	62,150	63,300	64,300
Wyoming	64,200	61,600	68,750
Montana	17,500	17,500	17,000
Colorado	3,900	4,000	3,900
New Mexico	112,550	112,550	112,550
California	631,200	610,200	591,200
Total U. S.	3,853,800	3,745,000	3,841,250
Crude Imports	98,430	107,700	81,700
Total New Supply	3,952,230	3,852,700	3,922,950

Weekly Changes in Crude Oil Stocks*

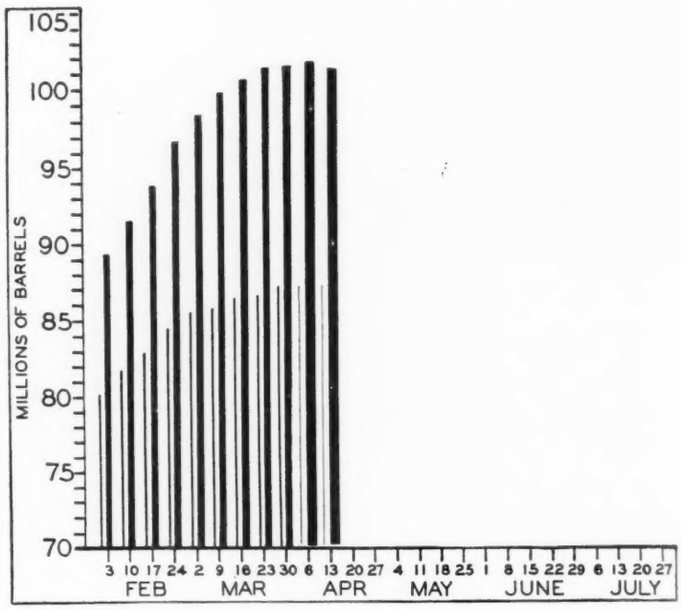
(Thousands of barrels)

Grade or origin	March 23	March 30	April 6	Change from March 30
Pennsylvania Grade	4,344	4,323	4,384	+ 61
Other Appalachian	1,232	1,206	1,185	— 21
Lima-Michigan	1,651	1,717	1,717	0
Illinois-Indiana	18,820	18,716	18,929	+ 213
Arkansas	3,133	3,105	3,027	— 78
Kansas	8,282	8,420	8,476	+ 56
Louisiana:	11,627	11,737	11,697	— 40
Northern	3,815	3,999	4,013	+ 14
Gulf Coast	7,812	7,738	7,684	— 54
New Mexico	6,860	6,938	7,239	+ 301
Oklahoma	62,256	62,651	62,814	+ 163
Texas:	73,608	76,339	76,626	+ 287
East Texas	16,829	17,481	17,469	— 12
West Texas	16,174	16,485	16,533	+ 48
Gulf Coast	17,932	18,911	19,310	+ 339
Other Texas	22,673	23,462	23,314	— 148
Rocky Mountain	17,270	17,256	17,182	— 74
California	36,080	36,015	36,044	+ 29
Foreign	2,238	2,138	2,577	+ 439
Total U. S. refinable	247,401	250,561	251,897	+1,136
Heavy in California	13,560	13,451	13,334	— 117

*As Compiled by U. S. Bureau of Mines.

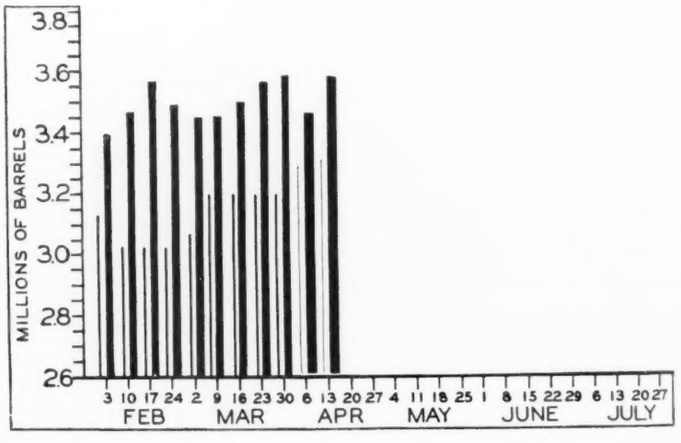
Total U. S. Motor Fuel Stocks

Heavy Line—1940 Light Line—1939



Daily Average Crude Runs to Stills

Heavy Line—1940 Light Line—1939



A. P. I. Weekly Refinery Report

(Figures in Thousands of Barrels of 42 Gallons Each)

Districts	Daily Average Crude to Stills Week Ended Apr. 13	Apr. 6	Per Cent of Reporting Capacity Operated Week Ended Apr. 13	Apr. 6	(a) Gasoline Production Week Ended Apr. 13	Apr. 6	Stocks Total Finished & Unfinished Motor Fuel (b) Week Ended Apr. 13	Apr. 6	Stocks of Gas Oil & Distillates At Refineries Week Ended Apr. 13	Apr. 6	At Terms. Trans. Pipelines Week Ended Apr. 13	Apr. 6	Stocks of Residual Fuel Oil At Refineries Week Ended Apr. 13	Apr. 6	At Terms. Trans. Pipelines Week Ended Apr. 13	Apr. 6
East Coast	595	530	92.5	84.2	1,614	1,517	22,476	21,982	1,964	1,758	3,840	3,548	3,279	3,198	4,738	4,553
Appalachian	115	112	81.0	78.9	414	373	4,021	3,983	282	273	128	140	589	685	.....	.....
Ind., Ill., Ky.	532	503	94.8	89.7	2,057	1,980	18,424	(e)18,353	2,135	2,127	212	195	3,260	3,232	29	30
Okla., Kans., Mo.	272	262	84.2	81.1	(e)906	(e)878	8,462	(e)8,790	957	1,002	21	12	1,880	1,889	.....	.....
Inland Texas	139	113	83.2	67.7	557	462	1,917	1,899	266	260	.....	.....	1,366	1,358	.....	.....
Texas Gulf	843	860	92.2	94.1	2,671	2,667	16,108	16,052	2,316	2,173	446	455	4,982	5,284	253	245
La., Gulf	133	129	83.1	80.6	299	298	2,865	3,044	671	599	29	26	620	845	235	268
No. La., Ark.	39	43	75.0	82.7	98	112	666	687	182	188	5	6	430	429	.....	.....
Rocky Mt.	47	50	71.2	75.8	196	217	1,751	1,758	142	147	.....	.....	564	581	.....	.....
California	492	496	67.4	67.9	1,248	1,324	18,087	18,327	7,497	7,517	1,984	2,000	55,100	55,426	23,110	23,091
Total Reporting	3,207	3,098	85.3	82.4	10,060	9,828	94,777	(e)94,875	16,412	16,044	6,665	6,382	72,070	72,927	28,365	28,187
U. S. Total (d)	3,570	3,455			11,630	11,362	101,837	(e)101,945	17,052	16,669	7,185	6,882	74,030	74,912	28,387	(e)28,565
U. S. Total 4-13-39 (d)	3,310				11,066		87,299		18,752		7,395		79,100		29,965	

(a) Includes straight-run, cracked and natural blended
(b) Includes stocks at refineries, in bulk-terminals, pipe lines and in transit
(c) 12% of reporting capacity in this district did not report gasoline production.
(d) Estimated, U. S. Bureau of Mines basis.
(e) Revised.

Refining Technology

INCLUDING INTERNATIONAL PETROLEUM TECHNOLOGY

J. C. CHATFIELD, Managing Editor

ANOTHER great contribution to the oil industry appears to have been made by metallurgists. Or, perhaps, you may not consider it an unmixed blessing since it probably will have the effect of reducing the consumption of lubricating oil.

This new contribution lies in a direction somewhat different from that which the metallurgists have taken in helping refiners in the past. It lies in new bearing metals rather than in the development of a new alloy to withstand the punishing temperatures and pressures which the cracking plant designer demands.

The new bearings to which we refer are not new alloys. The newness lies, rather, in unusual structural effects which have been attained in the process of manufacture known as "powder metallurgy."

Outside of the field of metal technology few have even heard of "powder metallurgy," yet it appears to be an industry which will impress itself on our economic life just as the booming new plastics industry is affecting thousands of manufacturers of all sorts of goods from tail lights to high heels.

★ ★ ★

Well, what is powder metallurgy?

In bare outline it consists, first, of the production of finely powdered metals by low temperature reduction of metal oxides or mechanical means and, second, the pressing and consolidation of these powders into solids without melting, and casting the metal as in normal foundry practice. One of the most useful features of powder metallurgy is that finely ground particles of metal will weld together or sinter at temperatures perhaps only three fourths as high as the melting point of the metal.

From the standpoint of the oil industry the most important fact about powder metallurgy is that objects formed of metal powders may have very unusual internal structure. They may be made quite porous, for example. It is this feature which has resulted in the development of prelubricated bearings.

The automotive industry is using a growing number of parts made by sintering powdered metals. Recently it was predicted that by 1942 the average motor car will contain 100 pounds of metal parts pressed from powder, largely replacing castings.

With porous bearings water pump troubles of an earlier day are on the way out. The capillarity of this type of bearing conveys oil directly through the wall to the bearing surface and insures an adequate supply of lubricant for all friction surfaces. Oil may be supplied continuously to the outer surface of the bearing from a reservoir and the lubricant manufacturer need not worry about producing a water pump grease which will stand up under difficult operating conditions.

The pre-lubricated bearing is a boon to the textile manufacturer whose goods may be ruined by excess oil. Tests have shown that a prelubricated bearing sealed in a household appliance will adequately lubricate the machine for several million revolutions. So now the housewife need no longer wonder whether she oiled the sewing machine or vacuum cleaner last week or last summer.

In many types of equipment the porous, pre-oiled bearing reduces wear. This is true because the pre-oiled bearing provides enough lubricant to minimize wear in the starting period before an oil pump can begin to function.

Early pre-lubricated bearings were formed of powdered copper, tin and graphite. Recently iron and iron-copper bearings have been employed because they can be used in more severe service.

★ ★ ★

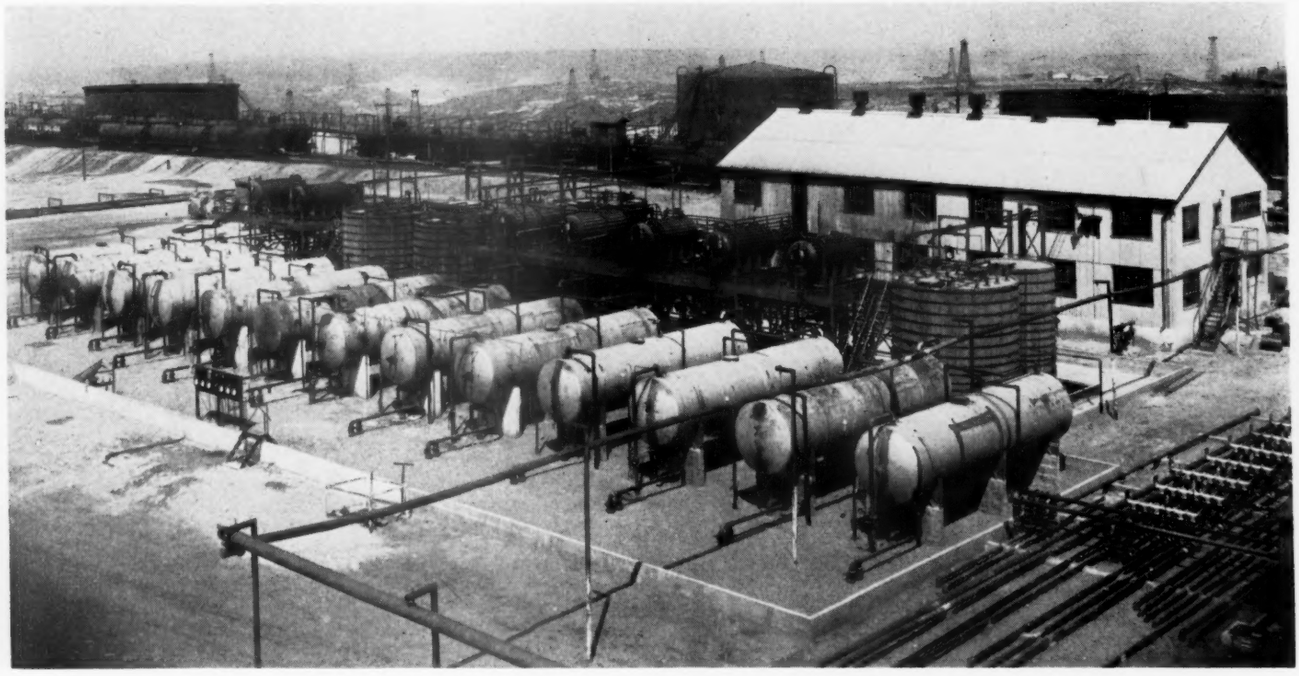
Here is how powdered iron articles are produced:

First the powdered iron is pressed to desired shape in a briquetting machine which may operate at pressures up to 100 tons per square inch. The powdered iron briquettes come from the machine looking very much like the finished part but without structural strength.

Briquettes are heat treated or sintered in an electric furnace at 1850 to 2100° F. in an inert atmosphere. Combination of the heat and pressure causes welding of the minute iron particles to create a strong metal object similar in appearance, tensile strength and hardness to a casting. Compressive strength may range from 75,000 pounds to 125,000 pounds per square inch.

Small gears are being produced which are lighter than cast gears due to their porosity but with comparable strength characteristics. From the standpoint of the manufacturer these gears are desirable because they eliminate costly machining and cut metal loss. It is said that the same weight of metal used for a cast gear will produce 3⅝ gears by powder metallurgy.

The new industry seems to be hungry for men with a background of technical training. A start has been made in satisfying the demand. Last December Stevens Institute of Technology began installation of a powder metallurgy laboratory. In February of this year it established a new department devoted to the subject. After only two months the new department has the largest enrollment of any division of the Stevens graduate school.



A 30,000-barrel-per-day Liquid Copper treater processing refinery gasoline for Phillips Petroleum Co. at Borger, Texas

100 Refineries Now Converting Mercaptans with Copper Salts

By M. G. Van Voorhis
N. P. N. Staff Writer

ABSTRACT

Three plants using copper salts in Perco's Solid and Liquid processes are converting mercaptans to disulfide with no octane drop and improved gum stability. Two natural gasoline plants using the Solid process operate with a minimum of attention and without the necessity for regenerating the catalyst. The Liquid process, generally used for cracked gasoline, is also a continuous process involving intimate contacting in a special centrifugal pump, gravity separation, and a regeneration step in which the agent is air bubbled into a tank of the reagent.

A NUMBER of alternatives are open to the refiner in the selection of methods for treating and sweetening gasoline which make it in some instances a difficult problem in economics to decide which offers the greatest saving in treating and manufacturing costs. Different combinations of refining methods, treating methods, the possible use of inhibitors and even the length of time in storage are all factors to be considered in any choice of treating methods.

Among the newer methods of treating are those involving the use of copper salts. These methods have drawn many refiners away from the conventional doctor treatment, formerly a prevalent method of sweetening. Copper sweetening methods developed and put into use nine years ago and now known as Perco processes were made available to the industry late in 1935. Fifty-seven companies are now using one or both of the two Perco methods in 96 refineries and natural gasoline plants, including eleven plants in foreign countries.

One of these methods, known as the "dry" or "Solid Process" requires the least attention and in some instances has contacted millions of barrels of gasoline without changing the reagent. Its application is limited to natural gasoline, light refinery straight-run and vapor recovery gasolines, and some kerosines and naphthas.

The "Liquid Process" is applicable to all types of sour distillates but is employed particularly for the sweetening of cracked gasolines. While its operation is not quite as simple, as the solid process, a Kansas refiner whose treating costs are higher than the average for this type of unit, considers the process more satisfactory

than any other methods tried or demonstrated on his products.

Both of these Perco treating methods provide 100% conversion of mercaptans to disulfide. In contrast to the older prevalent doctor treating, this treatment produces no octane drop. Improved gums and induction periods are indicated by laboratory tests and plant experiences, as well as less tetraethyl lead requirement, better stability, decreased inhibitor costs, and practically no gasoline loss. Discussion of the treating operation at three plants brought out positive expressions of preference for the Perco treatment over the doctor or other treatment previously used.

At the first of the three plants visited the copper treating process employs, as in numerous other plants where the process is used, part of older doctor sweetening equipment. This equipment can be converted to use with copper treating oftentimes to minimize the cost of installation. The treating vessels consist of two vertical tanks five feet in diameter and ten feet high. These can be used individually or in parallel. Inside these tanks is a five-foot bed of Fuller's earth impregnated with copper chloride solution, the reagent being 16-32 mesh, resting on perforated wooden plates separated by six to eight inches of hair felt.

AT this plant no auxiliary pumps are required. The raw natural gasoline comes direct from the stabilizer. Before entering the reaction chambers this gasoline is intimately mixed with filtered air from a 60-pound air supply. The mixing is accomplished by passing the gasoline into a small mixing chamber containing a porous disk through which the air enters. The disk serves to break up the entering air into tiny bubbles which are readily dissolved in the gasoline as it passes through the mixing chamber. This simple device is one of the features of the method which contributes to a large extent to the success of the method.

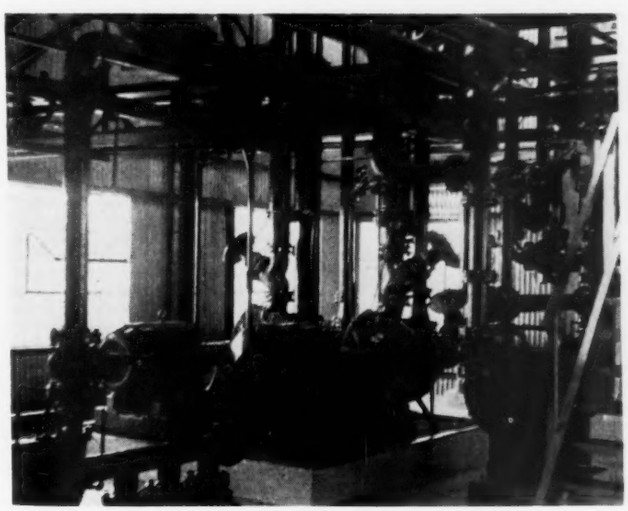
The volume of air released into the raw charge is governed by the per cent of mercaptans in the gasoline. Recording flowmeters are used on both the gasoline and air lines. A hand valve at the control board enables regulation of air flow. In some installations, proportioning meters are employed so that any change in gasoline flow will automatically regulate the air flow.

A certain amount of moisture is essential to the proper functioning of the treaters. Some moisture is produced by the sweetening reaction but in this plant more must be added occasionally. Very small amounts of moisture are added to the reaction chambers. The addition is accomplished by providing a ¼-inch steam line to the top of the tower. Steam is allowed to enter through the ¼-inch needle valve about 30 or 40 minutes per week. This adds from two to three gallons of water each time. At plants where the mercaptan content is larger, more moisture is produced and it may become necessary to dry the reagent bed at intervals.

The reagent treats from two to four volumes of gasoline per volume of reagent per hour, the contact period varying from 30 to 15 minutes, respectively.

Since installation of the unit Jan. 4, 1936, nearly 70,000,000 gallons of gasoline of 12 pounds Reid Vapor Pressure has been treated with but one overhauling of the treaters. This overhaul was not due to any degradation of the reagent but to a disturbance of the reagent bed due to a sudden reversal of flow. Manifolding is provided for flowing the gasoline through either of the two reagent beds and in either direction. Generally the flow is from top to bottom but to prevent any tendency to channel, the flow is reversed for a short period of time about every three weeks. All of the valves on this particular unit are plug valves which open full on a quarter turn.

At this plant the raw gasoline has only about .01% mercaptan sulfur to start with but the operation is said to be no different, except in quantity of air injected, to a plant in a West Texas field removing 0.3% of mercaptans. There have been no treating losses, it is said, the vapors leaving the gasoline with the air when the pres-



An inside view of the room housing centrifugal contacting pumps for the Liquid Process of a Kansas refinery. These are constructed of Durichlor to resist corrosion

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REFINING TECHNOLOGY

April 17, 1940

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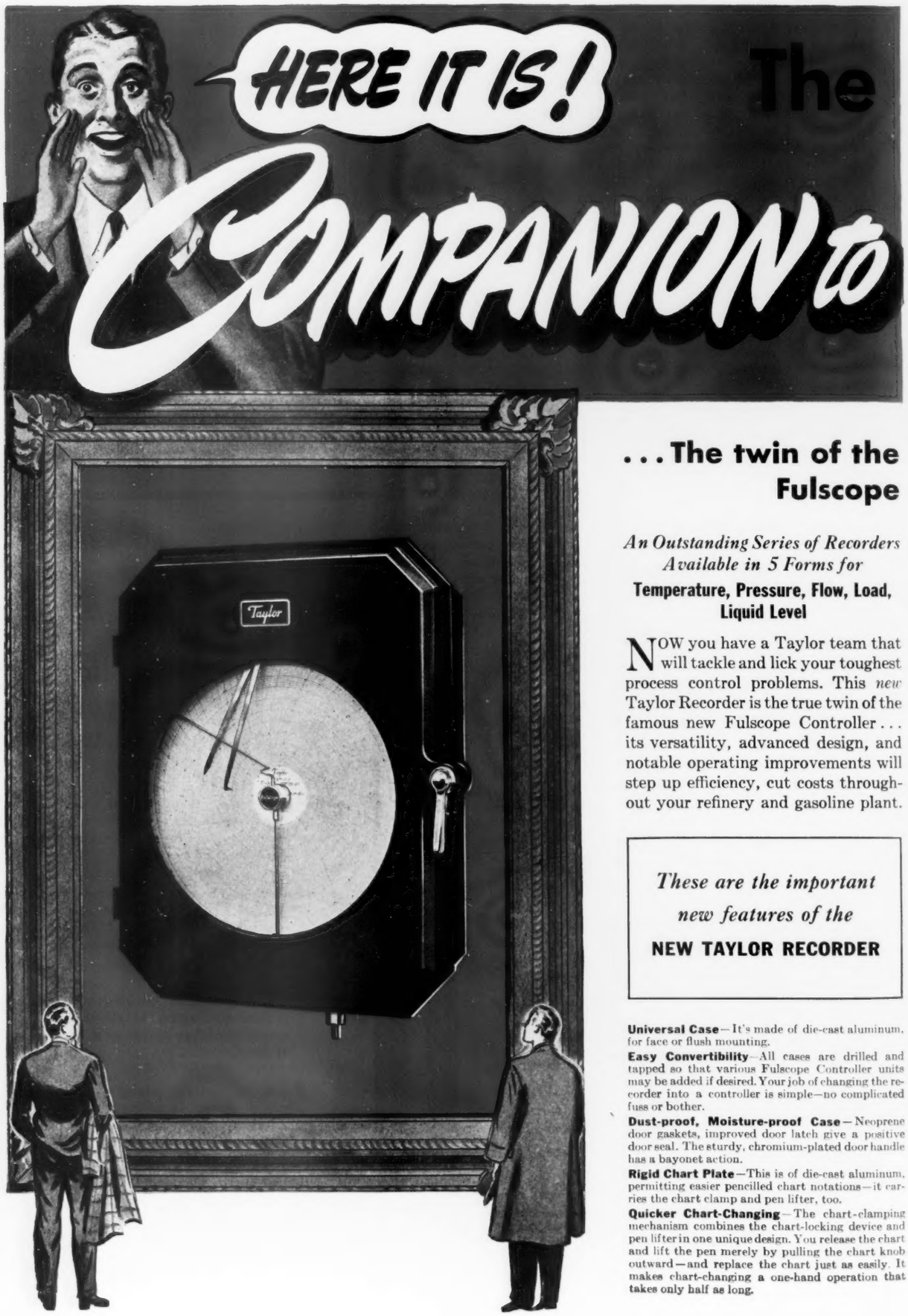

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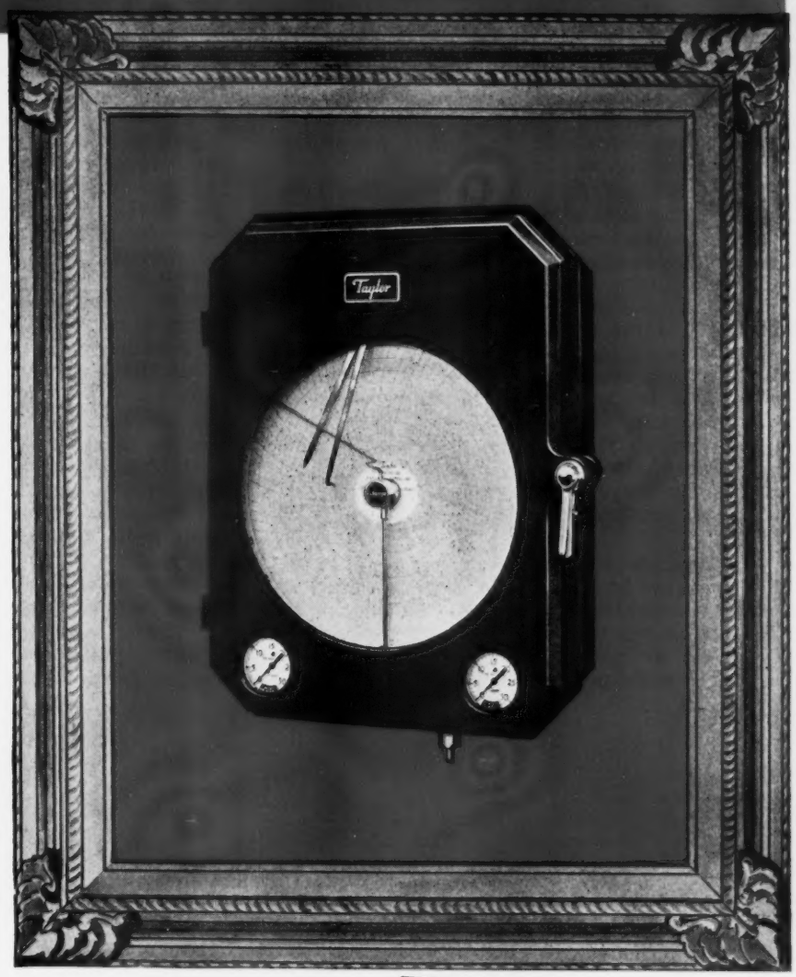
Dust-proof, Moisture-proof Case—Neoprene door gaskets, improved door latch give a positive door seal. The sturdy, chromium-plated door handle has a bayonet action.

Rigid Chart Plate—This is of die-cast aluminum, permitting easier pencilled chart notations—it carries the chart clamp and pen lifter, too.

Quicker Chart-Changing—The chart-clamping mechanism combines the chart-locking device and pen lifter in one unique design. You release the chart and lift the pen merely by pulling the chart knob outward—and replace the chart just as easily. It makes chart-changing a one-hand operation that takes only half as long.

New Taylor Recorder a MASTERPIECE



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The new Taylor Fulscope Controller offers you these 5 Forms of Control, with the new control effect, Pre-Act, in indicating and recording types*

Fixed High Sensitivity—for on-and-off control on applications with small time lags and large capacities, regardless of load changes.

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Taylor

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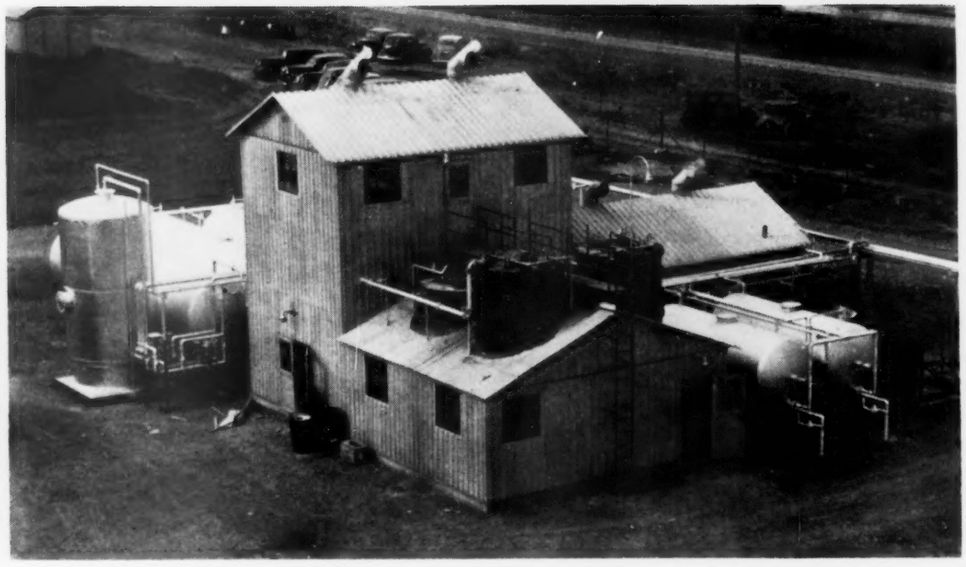
TEMPERATURE, PRESSURE, FLOW *and* LEVEL INSTRUMENTS



This Liquid Copper treater handles 3000 barrels per day of refinery gasoline for Glacier Production Co., Cut Bank, Mont. It was installed Sept. 15, 1939

sure is released being too small to detect by tank gauge.

No trouble with corrosion has been encountered. The interiors of the vessels containing the reagent are painted with a corrosion-resisting varnish.

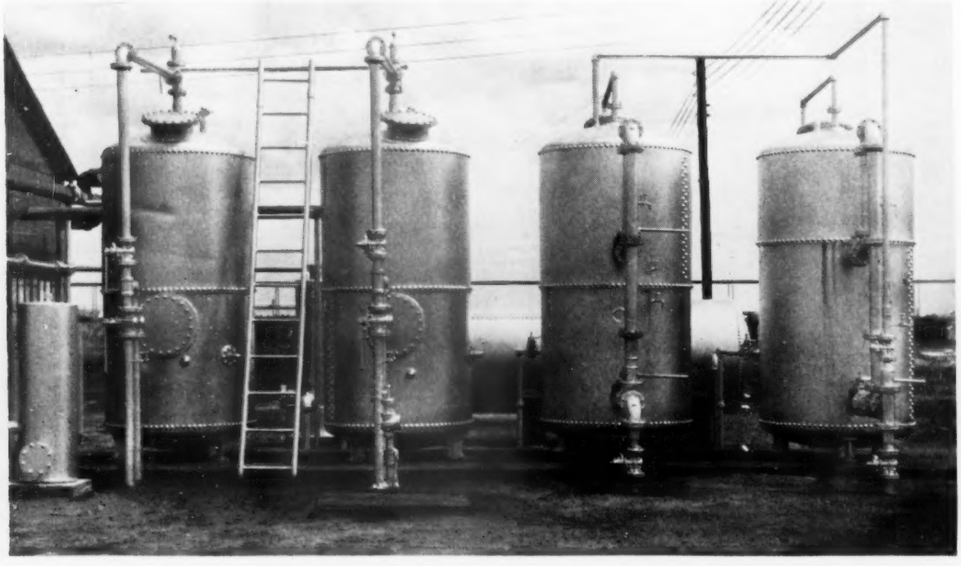
The cost of treatment at this plant has been carefully determined. The cost of equipment will vary over a wide range depending upon the availability of used tanks, fittings, piping, and instruments. The reagent, ready mixed with Fuller's earth, is figured at 5 cents a pound. Each vessel originally contained 4930 pounds and 2400 pounds were added at the time of overhaul to replace a portion that was lost and to increase the content of each vessel somewhat. This makes a total of 12,260 pounds used to date and still in use. Dividing the total volume of gasoline treated to date, which is 69,644,000 gallons, by 12,260 pounds gives about 5700 gallons treated by 5 cents worth of reagent and this volume is still increasing with no indication that the reagent will ever be exhausted. Reducing this to cents per barrel, the figure becomes 0.0368 cents per barrel.

The labor charge is based upon an average of an hour per shift or three hours per day. This is computed at $80 per month. Since there has been an average of 1,660,000 gallons a month treated during the period that the plant has been in operation, the labor charge has averaged close to 5 cents per 1000 gallons, or 0.202 cent per barrel. Without taking into consideration the equipment or depreciation, the treating cost for labor and reagent is 0.239 cent per barrel to date and still dropping as long as the present reagent is in use.

The second plant visited was of the same type as the first plant described. The minor differences are that new towers are employed instead of used equipment, flow is measured by indicating meters, gate valves instead of plug valves are used in the manifolding, and a water settler tank is included as part of the equipment. This plant is running an average of 40,000 gallons per day of a gasoline of low mercaptan content. Like the previous plant the reagent towers have been opened up for inspection but everything was found to be in good condition.

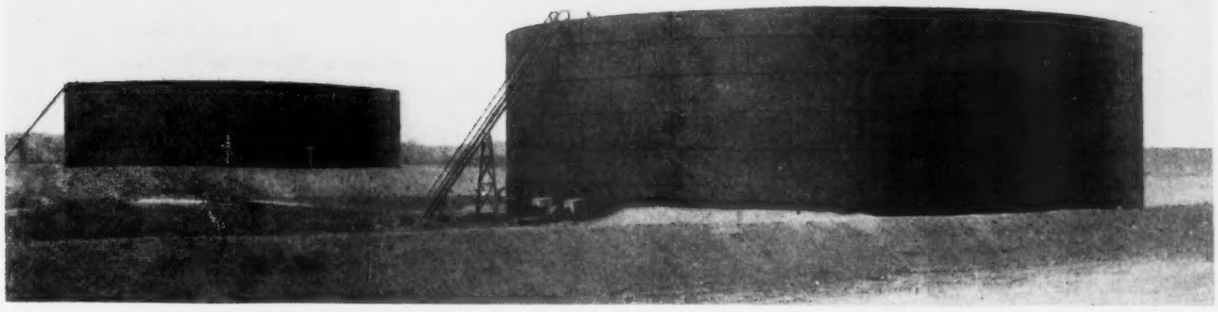
Since this treater went on stream, close to 30,000,000 gallons of gasoline have been passed through the reagent beds. The original charge of 9900 pounds of reagent is still in use. Little or no attention is required, according to the plant superintendent, because the unit practically runs itself. Like the first plant, the raw gasoline comes direct from the stabilizer without any pretreatment except the water settling. A slight amount of moisture is added when necessary.

While there are more than one so-called "dry copper treating process" the Perco liquid process is the only copper treating process wherein copper solutions are em-



The Phillips Petroleum Co. has had a 2000-barrel-per-day Solid Copper treater at its natural gasoline plant at McCamey, Texas, since November, 1935

TALK ABOUT BIG TANKS



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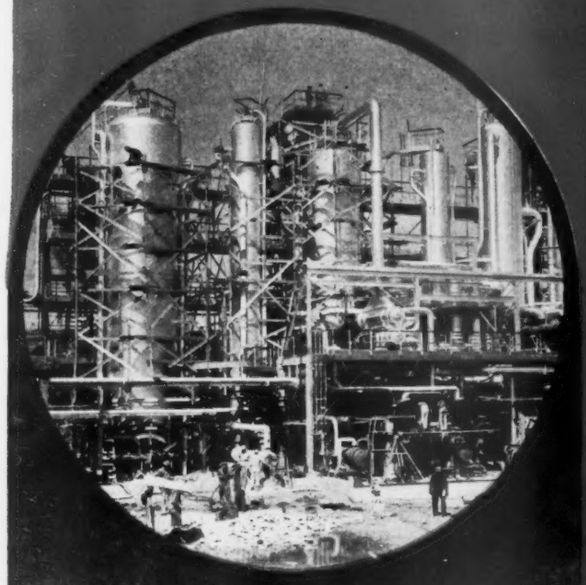
The Successful Operation of Refineries Depends Upon Many Individual Factors—



The selection of the correct processes, and the design and physical characteristics of the processing equipment play equally important parts in assuring greater and longer operating success for any refinery.

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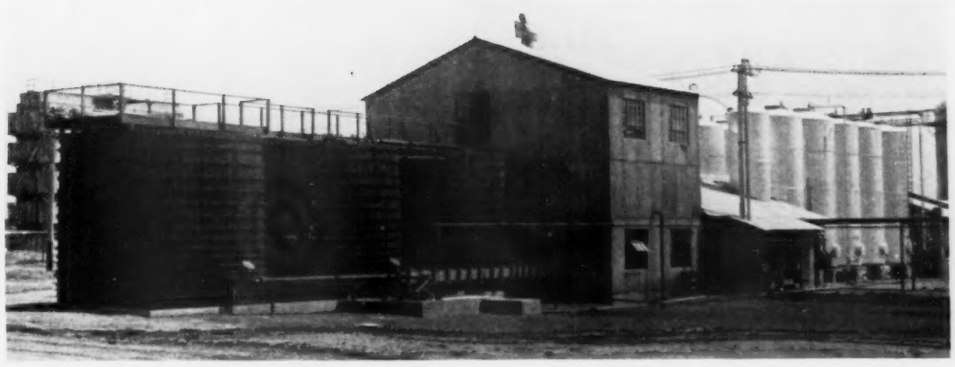


A Liquid Copper treater at a Kansas refinery treats 11,000 to 12,000 barrels of gasoline per day

ployed. Perco engineers have found that cracked gasolines can be effectively sweetened only by contact with copper solutions.

The third plant which was inspected is a complete refinery employing both the liquid and solid Perco treating methods. The refinery runs Kansas crude which is comparatively sour but the sweetening process is just as thorough as with less sour products. At this refinery part of the straight-run gasoline stock and the kerosine are solid treated and the balance of the straight-run and the cracked gasoline, plus the vapor recovery product, are treated in the liquid units. At this refinery the liquid units handle 11,000 to 12,000 barrels per day.

After settling the water out of the raw gasoline charge, hydrogen sulfide is removed by contact with caustic soda solution. This contacting is accomplished by the centrifugal pump which pumps the gasoline to a settling tank from which it overflows to a 10,000-barrel storage tank and the charge to the treaters is drawn from the top of this tank through a floating swing line.

The caustic wash system actually consists of three separate units for scrubbing light and heavy straight run and cracked gasoline. The kerosine does not require a preliminary caustic wash and is handled in the solid treater more or less in the same manner as described previously for natural gasoline.

THERE are two separate liquid Perco units using solution from a common solution regeneration system. Part of the time the different gasolines which are liquid treated are handled separately, but usually before the sour gasoline passes through the treating system it is first blended to the proportions of the finished product. This is accomplished by pumping the components into a common line feeding the copper sweetening contacting pumps. Exact proportions are maintained by recording flowmeter controllers.

The sour gasoline blend then is joined by the copper solution so that the proportions entering the contacting pump are 60% gasoline and 40% copper solution. The copper solution consists of a mixture of 14% copper sulfate ($CuSO_4.5H_2O$), 13% salt (NaCl), and 73% water. Percentages are by weight. Since the solution is highly corrosive the contacting centrifugal pump is made of Durichlor. The mixture is discharged to a glass-lined settling tank from which the copper solution is drawn off at the bottom at a rate sufficient to hold a constant level in the settling tank. The used solution passes to a reactivation tank. In the treating process cupric chloride, formed in the solution by the copper sulfate and sodium chloride, is converted to cuprous chloride. In the regeneration process air is blown into the solution through porous tubes submerged in the regenerator tanks. The air converts the cuprous chloride back to cupric chloride.

The regeneration takes place in a wooden tank 16 feet in diameter and 18 feet deep. The regenerated solution overflows from the regeneration tank and flows back into a storage tank of the same size. From here it is picked up by the contacting pump, thus completing the cycle.

The gasoline after contact with the copper sweetening solution may contain a small trace of copper compounds. Therefore, the gasoline leaving the settling tank goes through another mixing pump in contact with alkaline sodium sulfide solution which removes all copper from the gasoline, converting it to copper sulfide. Passing to a final settling tank the sodium sulfide solution settles out and is recycled through the final mixing pump and the gasoline is pumped to storage. Spent caustic from the H_2S removal treatment is used as a source of sodium sulfide. A charge of sodium sulfide solution, equal in volume to the quantity of gasoline treated per hour, usually lasts for months. In some plants a single charge has been used over a year.

The cost of operation at this plant is a little higher than at most other liquid plants in operation because of the large amount of H_2S in the charge. A careful accounting has been made of the chemical costs showing that the caustic wash for pretreat and aftertreat amounted to 0.14 cent per barrel of treated gasoline. Copper sulfate cost was computed to be .06 cent per barrel and salt at .004 cent per barrel, making the total chemicals cost 0.204 cent per barrel. This is figured on the amount consumed for the treatment of 2,000,000 barrels of gasoline.

Straight Run Gasoline—West Texas Crude

	Raw	Perco treated	Doctor treated
L-3 Octane			
0 cc. TEL	43.7	43.7	41.8
1 cc. TEL	53.7	53.7	52.0
2 cc. TEL	59.9	59.9	58.2
A. S. T. M. Distillation			
Initial	96	99	97
10% Evaporation	156	151	160
50% Evaporation	265	260	265
90% Evaporation	392	390	393
E. P.	440	434	430
Recovery, %	97.5	97.3	97.1
Residue, %	0.8	1.0	0.9
Loss, %	1.7	1.7	2.0
R. V. P.	7.75	7.85	7.6
A. P. I. Gravity	59.9	59.9	59.7
Color, Saybolt	+25	+25	Brown
Total Sulfur, %	0.100	0.101	0.117
Cu. Dish. Gum (Mg/100 cc.)	9.0	4.8	50.4

Cracked Gasoline from a Mixture of Kansas and Oklahoma Crudes

	Raw	Perco treated	Doctor treated
A. S. T. M. Octane Number			
0 cc. TEL	65.2	65.2	61.4
1 cc. TEL	74.5	74.5	71.0
2 cc. TEL	78.0	78.0	74.0
Distillation			
Initial	108	110	108
10% Evaporation	170	170	175
50% Evaporation	284	286	276
90% Evaporation	388	390	360
E. P.	420	422	400
A. P. I. Gravity	54.0	53.7	56.1
R. V. P.	5.1	5.6	4.9
Color Saybolt	+28	+28	+26
Induction Period, Min.	210	285	180
A. S. T. M. Gum (Mg/100 cc.)	1.4	1.0	1.4

Assemble Thermodynamic Data To Stimulate New Activity

ABSTRACT

A.C.S. Petroleum Division symposium reveals just what new thermodynamic data must be obtained to fill the gaps and make older data sufficiently accurate for present needs in predicting the course of reactions between hydrocarbons in proposed refining processes. Progress is reported in statistical methods, particularly in relation to the handling of vibration frequencies and allowing for possible restrictions (potentials or heat barriers) to internal rotational or torsional degrees of freedom of the molecules, which have been the chief difficulties encountered. Considerable use is made of the third law of thermodynamics in connection with molecular and experimental thermal data.

A SUMMARIZATION of present knowledge and data concerning the thermodynamic properties of hydrocarbons and related compounds was the object of a symposium of the Petroleum Division at the 99th annual meeting of the American Chemical Society meeting in Cincinnati last week.

The use of thermodynamics is as important to the chemical engineer as a set of blueprints to a building contractor since the question as to whether a chemical reaction will proceed at all in the desired direction, and to what extent under given conditions of temperature and pressure can be answered by simple calculations from the thermodynamic constants of the substances involved.

However, in the petroleum industry, as in some other important industries the technology is far in advance of the science and much development has come from empirical and costly methods of trial and error rather than from computation. Sufficient contributions have been made by theoretical considerations to the chemistry of cracking to demonstrate the value of more complete information about the thermodynamic properties of the various hydrocarbons.

Chemical thermodynamics is sometimes depreciated and sometimes overrated, it is pointed out by Dr. A. W. Francis, Socony-Vacuum Oil Co., in "The Science of Petroleum", first "because it tells nothing about the rate of reaction, a prime consideration from the point of view of production. In general, thermodynamics tells little about intermediate mechanisms, especially those involving free radicals or other 'imaginary' compounds not capable of isolation", he says.

"To manufacturing chemists in general, thermodynamics gives information concerning the stability of his substances, the yields which he may hope to attain, the methods of avoiding undesirable substances, the optimum range of temperature and pressure, the proper choice of solvent, the limitations of methods of fractional distillation and crystallization", is the way Lewis and Randall, University of California, put it in their book on "Thermodynamics." "To the analytical chemist," they add, "it offers the means of predicting the limits of possible error, of avoiding side-reactions, of choosing the concentrations best suited to his work."

The summary provided by the symposium revealed just what new thermodynamic data must be obtained to fill the gaps and make older data sufficiently accurate for present needs in the reactions of polymerization, alkylation, hydrogenation, dehydrogenation, isomerization, cracking, hydration, and others.

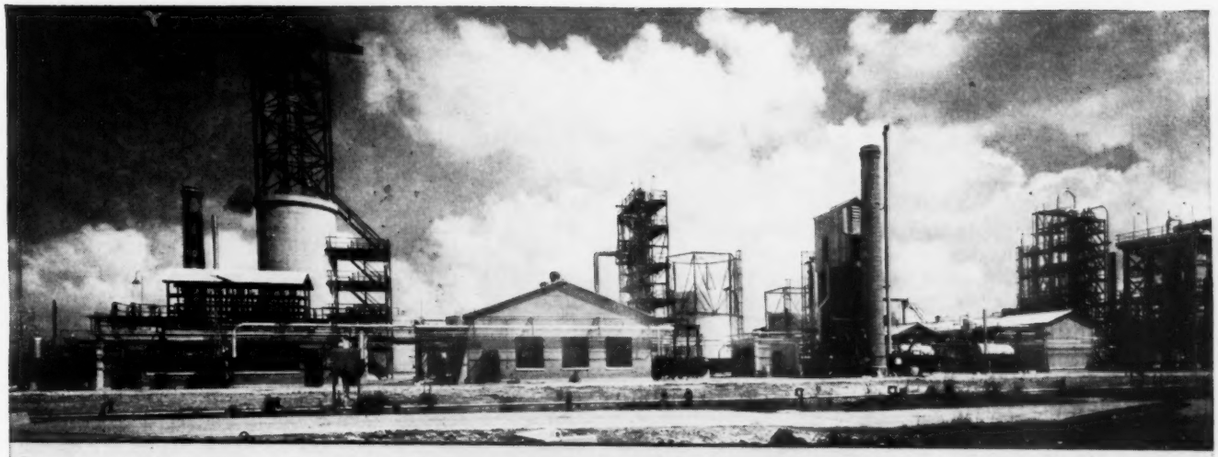
Higher Accuracy Needed

Requirements of accuracy in computing the heat constants of hydrocarbons have increased ten-fold or more in the past half-century, according to F. D. Rossini, National Bureau of Standards, who was chairman of the symposium and gave one of the five papers on "Heat of Formation of Gaseous Hydrocarbons".

The existing thermochemical data that have been obtained with modern calorimetric apparatus and technic, have all come from laboratories at Harvard University and the Bureau of Standards, Rossini said. The Bureau's data is all on heats of combustion and the Harvard data is on heats of hydrogenation. Rossini reviewed only the hydrocarbons containing eight or less carbon atoms per molecule for which determinations have been made during the past 15 years and tabulated heats of formation for those on which calorimetric measurements were made on the hydrocarbon in the gaseous state.

THE thermochemical data now being obtained at the Bureau on the hexanes and several higher paraffin hydrocarbons will make possible (1) the evaluation of the heats of formation of these hexanes and higher hydrocarbons, (2) the evaluation of heats of formation of the corresponding olefins whose heats of hydrogenation have already been measured, (3) an improvement in the accuracy of the extrapolation of the heats of formation of the gaseous normal paraffins beyond pentane and hexane, (4) a similar improvement in the accuracy of the extrapolation of the heats of formation of the gaseous normal olefins, (5) a reliable estimation of the heats of formation of all the remaining branched-chain paraffin hydrocarbons in the gaseous state that will not have been measured, and (6) a similar reliable estimation of the heats of formation of the remaining gaseous olefin hydrocarbons that will not have been measured, Dr. Rossini said.

While sufficient data are not yet available to make reliable quantitative estimates of the specific effects, the differences in the energy contents of isomers and the lack of constancy of the energy increment per CH_2 group may be ascribed to atomic interactions not yet successfully evaluated. On the basis of data now available, Dr. Rossini



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said several factors which apparently impart greater stability to hydrocarbon molecules have been discovered.

Dr. Rossini presented a table giving "best" values for the heats of formation of eight paraffin hydrocarbons (through the pentanes), 16 olefin hydrocarbons (through the pentenes), and three acetylene hydrocarbons, all in the gaseous state.

Gains in Statistical Method

Progress in the statistical method of calculating thermodynamic functions has reached "a stage where simple rigid polatomic molecules such as methane, ethylene, benzene, etc. can be treated with a practical degree of accuracy, provided that a careful study of the vibration frequencies has been made," E. B. Wilson, Jr., Harvard University, stated in his paper at the symposium. The calculation of the thermodynamic properties of simple gases from a knowledge of the structure and vibration frequencies of their molecules is now a well-established and important method of obtaining data. It is now possible to consider the contributions of the electronic, vibrational, rotational, and translational energies separately, since they are very nearly additive.

"Furthermore, simple molecules with one or two internal torsional degrees of freedom, such as ethane, propylene, dimethyl ether, etc. can also be dealt with with the same provision as above and if at least one experimental measurement of heat capacity, entropy, or free energy is available.

"The chief difficulties in handling molecules of the types which can now be computed are the determination of the vibration frequencies and the barrier heights, if any," i.e., restrictions to a possible internal rotational or torsional degree of freedom of the molecules. Wilson said "experience has shown that we do not yet know enough about vibrations to guess at vibration frequencies by analogy with other molecules. Such guesses are likely to be too inaccurate to give a good barrier height, although if only a very rough value of the thermodynamic quantities is helpful, estimated frequencies may suffice." Much work is being done in this field at several universities.

"More complicated molecules, such as chain hydrocarbons, have not yet been solved by these methods but there is hope that the classes of molecules which can be treated will continue to expand in the future as it has in the past," Wilson concluded. Accompanying Wilson's paper was a bibliography of 179 references.

Short-Cut to Free Energy Values

John G. Aston, Pennsylvania State College, showed that "by combining the molecular data with experimental thermal data and heats of combustion, satisfactory thermodynamic data may be obtained over a long temperature range." Aston used entropies of formation obtained from the third law of thermodynamics which states that the entropy of all "perfect" crystals at absolute zero is zero. Going down to 10° K., he said the necessary potentials or barriers restricting internal rotation can be obtained and thermodynamic functions calculated from 300° K. to 1200° K. (80° F. to 1700° F.) with the aid of the spectroscopic and molecular data. He said heat contents can be obtained with 1% accuracy from values of heats of combustion of the compound and that of the elements which form it. He also gave a standard formula for obtaining values of heat content at other temperatures, the third quantity required in computing free energies.

Aston showed three methods for checking the statistical method. The first showed that agreement with the calorimetric method could only be obtained by assuming either that the crystal was not perfect at low temperatures and the third law did not apply or that large potentials restricted internal rotation. Accumulated evidence favors the latter enough for acceptance. The only way to obtain these potentials, Aston said, is by comparison with experimental thermodynamic data. This means that it is not possible to calculate thermodynamic data from the molecular and spectroscopic data alone. "Yet if the third-law data are used in conjunction with the spectroscopic and molecular data quite reliable free energy values can be obtained for the gas over the range from 300° K. to 1500° K."

"If a third-law value is available for the entropy of the gaseous compound at room temperature (or at the normal boiling point) and if the spectroscopic and molecular data are relatively complete, the potentials hindering internal rotation can be obtained so as to make the entropy calculated statistically, agree with the third-law value. These potentials are then used with the molecular and spectroscopic data to obtain the heat capacity, heat content, and free energy of the gaseous compound over the desired temperature range."

Aston recommended the system used by Rodebush in the International Critical Tables since "single thermodynamic" functions are included which enable getting sensible heats directly whereas a table of heats of formation cannot be used for this purpose.

For many years the efforts of the Penn State laboratory have been directed towards the evaluation of thermodynamic functions of all lower hydrocarbons, Aston said. "The necessary data are now available for the computation of such tables for normal hydrocarbons. Thermal measurements down to 10° K. (—263° C. or —442° F.) have been completed which yield the entropies at the normal boiling points of n-butane and n-pentane, in the gaseous state." From these results and the data on the heats of combustion, tables including four thermodynamic functions at various temperatures are being computed.

Complex Hydrocarbons Yielding

A statistical method for calculating thermodynamic functions of the complex hydrocarbons with the present incomplete knowledge of their molecular constants was described by K. S. Pitzer, University of California. Agreement was obtained with all experimental data for the paraffins on the basis of reasonable rotation restricting barriers (or potentials as Aston called them). He found inconsistencies in the data for propylene, however, which make values for the higher olefins somewhat uncertain. He presented tables which give the heat and free energy functions for all the paraffins through the heptanes, together with some discussion of estimates for the higher members. These included complete revisions of figures presented in 1937.

The treatment which Pitzer presented, he described as follows: "A picture is set up for a given molecule involving atomic masses and the geometry of the equilibrium configuration, i.e., bond angles and distances. Also needed is a knowledge of the potential energy as a function of deviations from this equilibrium position. This is assumed to be given by an expression involving bond stretching and bending force constants, and internal rotation potential barriers. In terms of this picture it is then possible to calculate the entropy, heat capacity, and related thermodynamic functions.

"However, certain details of the molecular pictures are not yet known independently, and must then be obtained from experimental entropies or heat capacities with the above calculation reversed. Thus, for the present at least, the final result should be regarded as based on the experimental thermodynamic data employed. However, it is possible by these calculations to give reasonably certain values of thermodynamic quantities for temperatures other than those of the measurements, and even to extend the results to other molecules. In addition, valuable information is obtained concerning the forces operating within hydrocarbon molecules."

The principal aim of this work, Pitzer pointed out, was "to develop a method of correlating the available thermodynamic data for hydrocarbons, which would allow inter-

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polation and extrapolation to different temperatures, different thermodynamic functions, and different but related molecules. The accuracy of the results depends in some cases solely on the experimental thermodynamic data employed. In other cases it depends also on the accuracy of the pictutre drawn from molecular structure data, and on the accuracy of the statistical methods employed. In addition, by these methods certain of the missing elements in our picture of the hydrocabon structures can be filled in."

These data were believed to be useful. The fact that hydrocarbon equilibria are so hard to measure directly makes indirect data of this type even more valuable, Pitzer concluded.

Third Law Used on Complex Molecules

George S. Parks, Stanford University, used the third law of thermodynamics to determine the free energies of formation of a number of typical hydrocarbons containing six or more carbon atoms. He evaluated the quantitative effects associated with hydrocarbon type, CH_2 increments, branching, etc., with considerably greater accuracy than in the past, he said, due mainly to utilization of modern highly reliable data for the heats of combustion involved.

Parks claimed that statistical calculations of entropy and free energy, though they have yielded extremely accurate values for some of the simpler molecules have not been really successful in dealing with more complicated molecules. Equilibrium measurements can be only an auxiliary tool, he said.

Thermodynamic functions derived through the third law have been obtained for normal paraffins with reasonable accuracy up through dotriacontane ($C_{32}H_{66}$), Parks said, and he presented a table of values. The free energies of branched paraffins present an interesting problem which should be investigated further, he said. Various results of work done in this field point to the conclusion that at room temperature the 2-methyl iso-paraffin is definitely more stable than the corresponding straight chain compound, he concluded. The withdrawal of a mol of hydrogen from a paraffin to produce an olefin hydrocarbon always raises the molal free energy considerably.

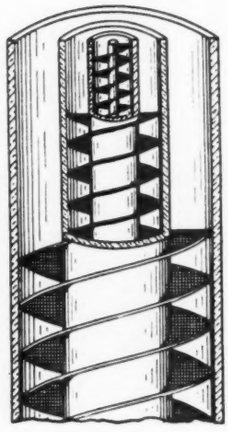
Parks found that hydrocarbons containing five or six membered rings occupied free energy levels somewhat intermediate between the corresponding aliphatic paraffins and olefins. The present stage of investigation of the cyclohexane and cyclopentane series showed that breaking the symmetry of the ring in cyclohexane to produce the methyl derivative produces a marked drop in molal free energy and progressive increases in the aliphatic side chain on the ring cause an increase in molal free energy similar to that found with normal paraffins.

While entropy determinations have been made for about 30 aromatic hydrocarbons, the corresponding combustion data are in many cases inadequate for an accurate evaluation of molal free energy by the fundmental equation. Parks concluded that the problems of free energy determination merit much additional study both for room temperature and elevated temperatures. He summarized his findings with the following table of typical compounds containing ten atoms in the molecule.

Free Energy Values for Typical Hydrocarbons at 25° C.

Substance	Formula	$\Delta F°_f$
n-Decane	$C_{10}H_{22}$	3,490 b
2-Methylnonane	$C_{10}H_{22}$	2,000 b
n-Decylene-2	$C_{10}H_{20}$	24,100 (estimated)
n-Butylcyclohexane	$C_{10}H_{20}$	7,000 (estimated)
n-Butylbenzene	$C_{10}H_{14}$	29,670 a
Naphthalene	$C_{10}H_8$	47,430 b

New Laboratory Column Packing Makes Record in Efficiency



A modification of the spiral screen packing. The use of several concentric spirals increases the free space thereby increasing throughput

A new type of packing for laboratory fractionating columns embodying a continuous flat spiral of metal gauze enclosed between two concentric tubes was described in the Petroleum Division sessions of the American Chemical Society in Cincinnati, April 8-12, in a paper by H. S. Lecky and R. H. Ewell, Purdue University.

This packing was said to give very high efficiencies, 32 plates per foot or 0.375 inch H.E.T.P. (height equivalent of a theoretical plate), exceeding the Stedman conical wire gauze packing. It was also characterized as having large throughput without loss of efficiency, small holdup, and small pressure drop. Several columns have been constructed with this packing using a heated jacket of a common type and a conventional type of still-head.

The packing was constructed by punching washers from 60 x 60 mesh nickel gauze. Each washer was then cut along a radius and these split washers spot-welded together to form a long continuous spiral. The center hole is 1/3 the diameter of the spiral and the turns spaced to give an average vapor path six to ten times the vertical height. Packings of ¾-inch and 1½-inch diameter have been made. A glass tube with sealed ends is used in the center hole for support and to direct vapor flow.

To prevent leakage between the spiral gauze and the outer glass tube a narrow strip of metal foil is crimped around the outside edge of the spiral.

An important observation was that the efficiency does not drop until high reflux rates (or high vapor velocities) are reached. The tests with the 1½-inch packing have not been completed, but preliminary tests indicate that contrary to nearly all other types of packing, the efficiency, as well as the throughput, increases with increasing diameter. This is possible because the turns can be spaced closely enough that the length of vapor path per unit vertical height increases with increasing diameter, it was said. The use of several concentric spirals was suggested as a means of increasing the free space, thereby increasing the throughput.

The authors compared performance of several types of packing in the accompanying table.

Comparative Performance of Various Types of Packing

	Plates per foot	H. E. T. P.	Hold-up	Pressure drop per plate	Effect on efficiency of increasing diameter	Throughput comparing similar cross-sections
Podbelniak	2-3	4"-6"	Very low	0.02 mm. Hg.	Decreases rapidly	Medium
Glass helices	5.2	2.3"	Very high	1.0 mm. Hg.	Practically no change	High
Metal helices	6.3	1.9"	Very high	1.5 mm. Hg.	Practically no change	High
Spiral sheathing	12	1.0"	High Low	0.06 mm. Hg.	Increases	Low
Stedman	24	0.5"	0.33 cc/plate	0.05 mm. Hg.	Decreases	Medium
Spiral Gauze	30	0.4"	Very low 0.25 cc/plate	0.05 mm. Hg.	Increases	High

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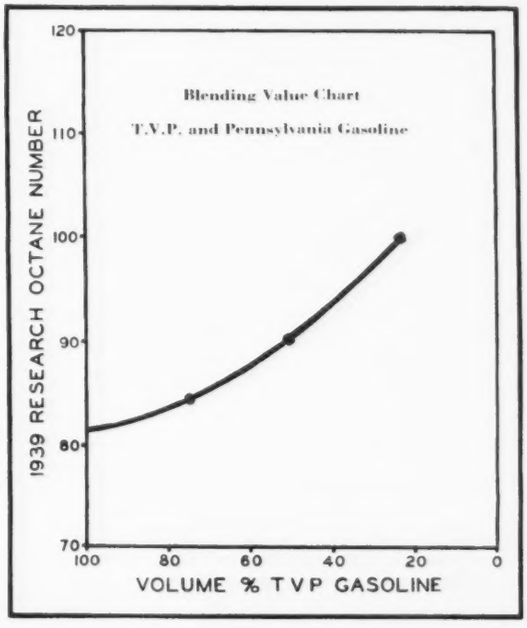

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Isolate Eight New Hydrocarbons In Analysis Project

ABSTRACT

Progress in the determination of hydrocarbons found in petroleum during the past year has been made in the study of kerosine from which four compounds have been separated so far, and in the 188-208°F. boiling point range from which another four compounds have been isolated and identified. This work has been done at the Bureau of Standards as a part of A.P.I. Project 6.

Analytical work at the University of Texas has led to the isolation of a new $C_{15}H_{19}N$ kero base by a method involving ozonization. The method used in identifying alkyls at position 8 in quinoline homologs is believed to be generally applicable and efforts are being directed toward locating positions of alkylation in the higher alkyls. In another project aimed at synthesis of naphthenic acid and the naphthenic base, the establishment of a structural correlation of a naphthenic acid and a naphthenic base from petroleum was reported.

THE first report on the separation of the hydrocarbons in the kerosine fraction of petroleum by the Bureau of Standards, covering isolation of four compounds, was reported by B. J. Mair and A. J. Streiff in a paper presented at the Cincinnati meeting of the American Chemical Society, April 11. These are n-dodecane, naphthalene, 2-methylnapthalene, and 1-methylnaphthalene. The work is a part of the American Petroleum Institute Research Project 6.

The separation was made upon that part of the petroleum distilling between 114° and 144° C. (237° and 291° F.) at 56 mm. Hg. or between 200° and 230° C. (392° and 446° F.) at 760 mm. (atmospheric pressure at sea level). By crystallization, n-dodecane was first isolated from a middle fraction. The rest of the material was then systematically extracted with the reflux in a two-solvent process (methyl cyanide and "Marcol") in order to separate the aromatic hydrocarbons from the paraffins and napthalenes. The other three compounds were isolated from the aromatic fractions by fractional crystallization.

The recovered n-dodecane accounted for 11.7% of the original distillate out of a total contained quantity estimated at 13.6 ± 0.8%. The other three compounds combined amounted to 2% of the original distillate out of the estimated total of 2.88%. Naphthalene recovery amounted to 0.41%, 2-methylnapthalene 1.28%, and 1-methylnaphthalene 0.35%. Table 1 gives values of certain physical properties of the four hydrocarbons, all extrapolated to material of 100%.

Separate 87-98° Fractions

Augustus R. Glasgow, Jr., Bureau of Standards, gave the first report on the separation of the fraction boiling between 87° and 98° C. (188° and 208° F.). He said the presence of "isoheptane" and "dimethylcyclopentane" in this fraction had been reported many times but no one has actually separated this fraction into its component hydrocarbons. The isolation and identification of 2-methylhexane, 3 methylhexane, *trans*-1, 2-dimethylcyclopentate, and *trans*-1, 3-dimethylcyclopentane from the distillate normally boiling between 90° and 92° C. was reported by Glasgow.

Alternation of atmospheric distillation and azeotropic distillation with methyl alcohol separated the material boiling between 90° and 91.2° C. into a paraffinic concentrate containing approximately 75% of 2-methylhexane and a naphthenic concentrate. From this material *trans*-1, 3-dimethylcyclopentane was isolated by crystallization from liquid ethane. A similar procedure separated the material boiling between 91.2° and 92° C. into naphthenic and a paraffinic concentrate from which *trans*-1, 2-dimethylcyclopentane was isolated by crystallization from liquid propane plus methane. From the paraffinic concentrate 3-methylhexane was obtained in the residue from distillations at reduced pressure.

From the 6.5-liter fraction distilling between 89.6° and 92.2° C. at 760 mm. Hg. a yield of 1.6, 1.4, 1.5, and 2.0 liters of 2-methylhexane, *trans*-1, 3-dimenthylcyclopentane, 3-methylhexane, and *trans*-1, 2-dimethylcyclopentane were obtained respectively. Table 2 gives values of physical properties of the three new hydrocarbons, all extrapolated to material of 100%.

New $C_{15}H_{19}N$ Base Isolated

At the University of Texas a new $C_{15}H_{19}N$ kero base has been isolated by counter-current extraction. The structure of this compound, 2, 4-dimethyl-8-sec.-butylquinoline was established through chromic acid oxidation to 2, 4-dimethylquinoline-8-carboxylic acid. The work was reported by L. M. Schenck and J. R. Bailey during the Petroleum Division sessions.

In ozonization the base was degraded to 1-methyl-butyric acid and a structural formula determined for the new

Table 1

Properties of New Hydrocarbons in the Kerosine Fraction

Hydrocarbon	n-Dodecane	Naphthalene	1-Methyl-naphthalene	2-Methyl-naphthalene
Boiling pt. at 760 mm., °C.	216.26 ± 0.03	217.96 ± 0.03	244.78 ± 0.10	241.14 ± 0.05
Freezing pt. in air, °C.	—9.60 ± 0.02	80.27 ± 0.02	—30.77 ± 0.06	34.44 ± 0.02
Density at t° C., g/ml.	0.74512 ± 0.00005	0.9752 ± 0.0002	1.0163 ± 0.0001	0.99045 ± 0.00005
Refractive index at t° C., n_D	1.4195 ± 0.00010	1.5898 ± 0.0002	1.61494 ± 0.00010	1.60192 ± 0.00010
Refractive dispersion at t° C., n_F-n_C	0.00733 ± 0.00010	0.0289 ± 0.0002	0.02995 ± 0.00010	0.02899 ± 0.00010
Temperature of density, refractive index, and dispersion measurements, °C.	25	85	25	40

Table 2

Properties of New Hydrocarbons Boiling Between 90° and 92° C.

Hydrocarbon	Trans-1, 3-Dimethyl-cyclopentane		Trans-1, 2-Dimethyl-cyclopentane		3-Methylhexane	
Boiling pt. at 760 mm., °C.	90.87	0.10	91.89	0.02	91.96	0.07
Freezing pt. in air, °C.	—136.3	0.5	—119.25	0.15	.....	.....
Density at 20° C., g/ml.	0.7444	0.0005	0.7519	0.0003	0.6859	0.0008
Refractive index at t° C., n_D	1.4088	0.0003	1.4120	0.0001	1.3877	0.0005
Critical Soln. in aniline, °C.	49.9	0.5	46.7	0.3	70.6	0.3

16 YEARS OF CONSISTENT LOW COST PRODUCTION

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Since that time Gray Clay Treating acceptance has increased until today it is widely used by all classes of refiners. That's largely because it consistently fits the requirements of refiners for economically treating gasolines in conjunction with a large variety of cracking processes.

Gray Clay Treating Units will produce low gum content gasoline without loss of octane number. They will last throughout the life of the cracking unit. Often, when new cracking units have replaced old ones, the Gray Process has again been chosen to treat the gasoline.

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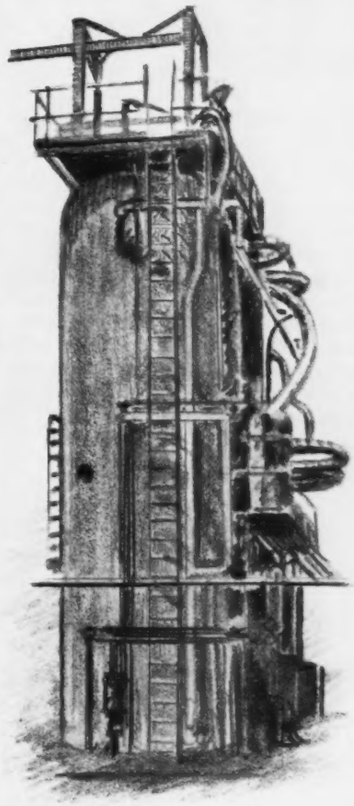


OVER 7 MILLION BARRELS

In 1926 a certain refiner installed a small Gray Clay Treating Unit. To date this unit has produced 7,655,000 barrels of low gum content gasoline.

GRAY CLAY TREATING

base in which there is a secondary butyl at position 8. This method of identifying alkyls at position 8 in quinoline homologs is believed to be generally applicable. At least the authors found that 2, 3, 4-trimethyl-8-n-propylquinoline yields n-butyric acid.

An exhaustive study of locating positions of alkylation through the medium of ozonization, especially as concerns the higher alkyls, is contemplated. The preparation of 2, 4-dimethyl-6-sec.-butylquinoline is under way to determine whether 1-methylbutyric acid will be an ozonization product.

Further use of ozonization was reported by Billie Shive and J. R. Bailey, University of Texas, in the "unexpected discovery that direct ozonization of the $C_{15}H_{25}N$ base leads to the formation of the amide of the $C_{10}H_{18}O_2$ acid, obtained by Roberts and Bailey from the benzoyl derivative of the $C_{15}H_{31}N$ base." A fortunate coincidence in connection with this research was said to be the recent discovery by Dr. H. L. Lochte and J. T. Horeczy, Texas Laboratory, of a new $C_{10}H_{18}O_2$ naphthenic acid in a straight-run distillate of California petroleum which has been found identical with the acid originally obtained by Roberts and Bailey in the degradation of the $C_{15}H_{31}N$ base. This is said to establish for the first time a structural correlation of a naphthenic acid and a naphthenic base from petroleum.

The final objectives of Shive's investigation are the synthesis of the naphthenic acid and the naphthenic base. That of the acid is now under way.

Aetna Oil Executive is Early Polymerization Developer

Dr. Clive M. Alexander, whose photograph appears on the cover of this week's issue, recently was elected to the Board of Directors of Aetna Oil Service, Louisville, Ky., as vice president in charge of manufacturing and transportation. While Dr. Alexander has been with Aetna since January, 1939, he had served the company in a consulting capacity for several years. For about eight years he devoted most of his time as a consultant to Aetna and then a year ago he began giving full time to the company as manager of refining and transportation.

Dr. Alexander, an Iowan by birth, attended the State University of Iowa where he received the degree of Sh. E. He completed his college training in chemical engineering at Columbia University and received the Ph. D. degree. At Columbia his interest in research work on hydrocarbon decomposition led him into the petroleum industry.

Practical experience in oil refining started with his connection with Gulf Refining Co., Port Arthur, Texas, as process engineer. For that company Dr. Alexander developed vapor phase cracking and obtained a number of process and equipment patents on this process and polymerization. He was one of the first developers of thermal polymerization. Later he invented and patented a number of other petroleum refinery processes and equipment.

After leaving Gulf Refining Co., Dr. Alexander spent several years as a consulting engineer in petroleum refining and had connections with Pan-American Petroleum and Transport Co. and Shell Petroleum Corp. He was also connected with Texas Oil Products Co. and Imperial Refineries. He became general manager of the latter company.

Dr. Alexander's present connection is with a company marketing intensively in Kenutcky, Indiana, and Tennessee and having highly developed river transportation for both crude oil and finished products. Present refinery capacity is 8000 barrels per day.

Correction

Utilization of cut-back asphalt increased ten-fold in a decade, not asphalt as a whole, as might be construed from the abstract of Bernard E. Gray's paper March 20, p. R-91.

Increase In Reflux Ratio Sharpens Separation

721

Following a study of the effect of reflux ratio calculations in batch fractionation, which was described during the Petroleum Division sessions of the American Chemical Society at Cincinnati, April 11, Arthur Rose and H. H. Long, Pennsylvania State College, concluded that "increased reflux ratio gives sharper separation, and that the magnitude of the effect of reflux ratio in any given case depends upon the vapor pressure ratio (α) and total equivalent plates (n) as well as reflux ratio (R), with the order of importance generally being α, R, n."

The effect of increasing R was found to be always proportionately greater at small values of R than at larger values (assuming α and n remain the same). When α and the overall fractionating factor (α^n) are both relatively large, R was found to have a very marked effect on the sharpness of separation at low values of R, and little effect at higher values. When α is small, R has but relatively little effect on sharpness of separation regardless of the values of α^n, n and R, unless the α^n and n are made very large, it was found.

With a given value of α^n, a small value of α results in reflux ratio changes having but a small effect on sharpness of separation at all reflux ratios, while a large value of α results in a marked effect for small reflux ratios with little effect for higher ones. Increase of n was found to cause R to have more effect (at low values of R) but this is more noticeable when α is large than when small. With given values of α and R, the effect of increasing n is much more marked when R is large than when it is small, it was concluded. Graphical evidence was presented to show reasons for these conclusions.

All of the results obtained from these computations are subject to several limitations, it was pointed out, because of assumptions involved. These are:

"1. The mixture distilled follows Raoult's law.

"2. The variation in the vapor pressure ratio is negligible.

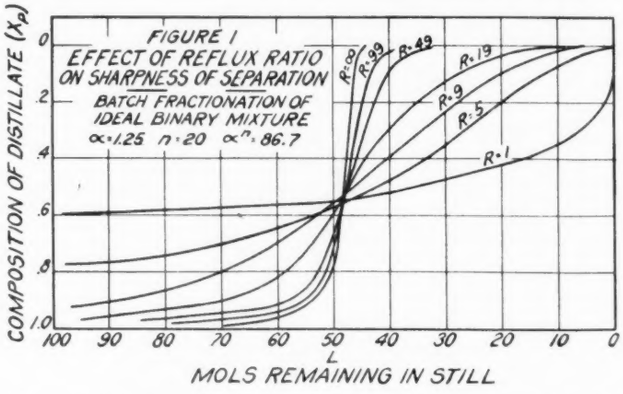
"3. The usual simplifying assumptions regarding heat losses from the column and equimolal overflow, and equal heats of vaporization, are justified.

"4. The mixture distilled has only two components.

"5. The holdup is negligible.

"6. The efficiency is not affected by the reflux ratio or other operating conditions."

The procedure, however, may be extended to include cases in which the assumptions are not justified, it was said, although such extension always complicates the calculations or makes them more laborious. In evaluating and using the authors' method and conclusions, it was recalled that "in ordinary batch fractionation practice it is not usually convenient to make accurate measurements of reflux ratio and equivalent plates and in fact it is probably quite difficult to make such measurements accurately."



It would be expected from qualitative considerations that the sharpness of separation would vary markedly as the reflux ratio was changed, but the calculated curves give a definite idea of the relative advantages of successive increase in reflux ratio

New Patents

Compiled by R. E. Burnham, patent and trade-mark attorney, 511 Eleventh Street, NW, Washington, D. C., from who copies may be obtained at rate of 25c each. State number of patent and name of inventor when ordering.

March 12, 1940

Vapor phase operation—E. J. Houdry, Haverford, Pa., assignor to Houdry Process Corp. Filed July 10, 1937. No. 2,192,911.

Processes for resolving petroleum emulsions—De Groote, Keiser and Blair, assignors to Petrolite Corp. Filed April 19, 1939. Nos. 2,192,993, 2,192,994, and 2,192,995.

Oil treating heater and like—Charles Prater, Seminole, and H. F. Brindel, Tulsa, assignors to Gulf Oil Corp. Filed Nov. 1, 1937. No. 2,192,041.

Process for removal of sulfuric acid compounds from hydrocarbon oils—W. P. Gage, Deer Park, Tex., assignor to Shell Development Co. Filed Aug. 2, 1938. No. 2,193,417.

Treatment of hydrocarbon oils—G. W. Gray, New York, assignor to Texaco Development Corp. Filed July 15, 1929. No. 2,193,625.

Process for purification of crude light oils—I. H. Jones, Pittsburgh, assignor to Koppers Co. Filed Mar. 14, 1931. No. 2,193,763.

Dewaxing hydrocarbon oils—R. E. Manley, B. Y. McCarty, and W. V. Overbaugh, assignors to Texaco Development Corp. Filed Aug. 6, 1937. No. 2,193,767.

Conversion of hydrocarbon oils and gases—R. L. Savage, Jr., Port Arthur, Tex., assignor to Texaco Development Corp. Filed Aug. 5, 1937. No. 2,193,772.

Conversion of hydrocarbon oil—R. F. Trow, Tuckahoe, N. Y., assignor to Texaco Development Corp. Filed Sept. 19, 1938. No. 2,193,776.

Phosphonitrilic condensation product—David Lipkin, Philadelphia, assignor to Atlantic Refining Co. Filed June 10, 1937. No. 2,192,921.

Lubricant—P. C. Panagiotakos, Lawrence, Mass., assignor to Atlantic Refining Co. Filed Oct. 30, 1936. No. 2,192,930.

Lubricant—A. J. Kraus, Jersey City, assignor to Richards Chemical Works. Filed Nov. 29, 1937. No. 2,192,976.

Stabilized mineral oil composition—L. A. Hamilton, Wenonah, and E. W. Fuller, Woodbury, N. J., assignors to Socony-Vacuum Oil Co. Filed Feb. 2, 1939. No. 2,193,331.

Cutting oil—F. W. Corkery, Crafton, Pa., assignor to Pennsylvania Industrial Chemical Corp. Filed July 1, 1938. No. 2,193,476.

Process for production of aliphatic dicarboxylic acids—S. H. McAllister, Lafayette, Cal., assignor to Shell Development Co. Filed Oct. 8, 1938. No. 2,193,562.

Mineral oil composition (cracked motor fuel) and process of treating same—T. W. Bartram, Nitro, W. Va., assignor to Monsanto Chemical Co. Filed Sept. 12, 1935. No. 2,193,666.

Lubricating oil composition—O. P. Puryear, Fishkill, N. Y., assignor to Texaco Development Corp. Filed Oct. 6, 1937. No. 2,193,771.

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This index is published as a convenience to the reader. Every care is taken to make it accurate, but National Petroleum News assumes no responsibiltity for errors or omissions

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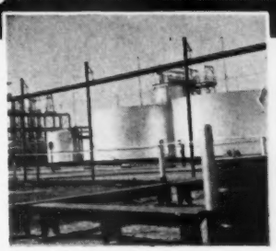
POSITIVE METAL PROTECTION
for the Petroleum Industry



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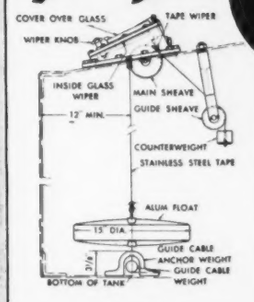

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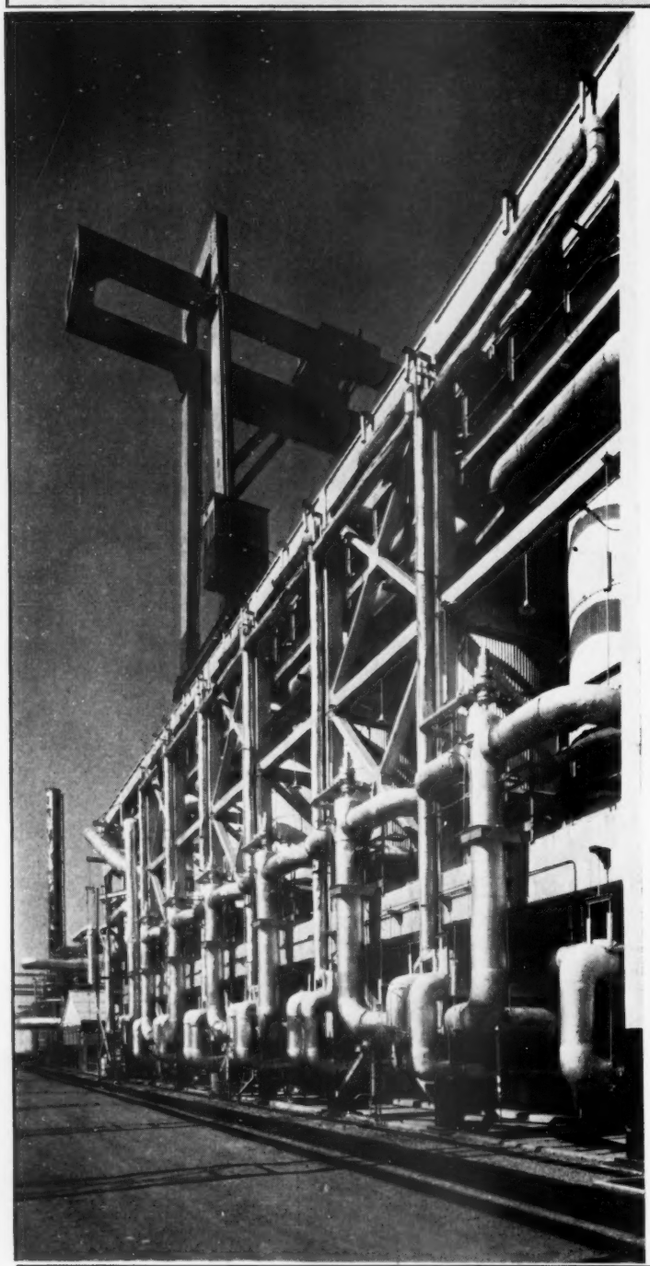

SUN Shipbuilding and Dry Dock Co. have gained unique experience in the fabrication of unusual and complicated equipment during the development of the Houdry Catalytic Cracking Process.

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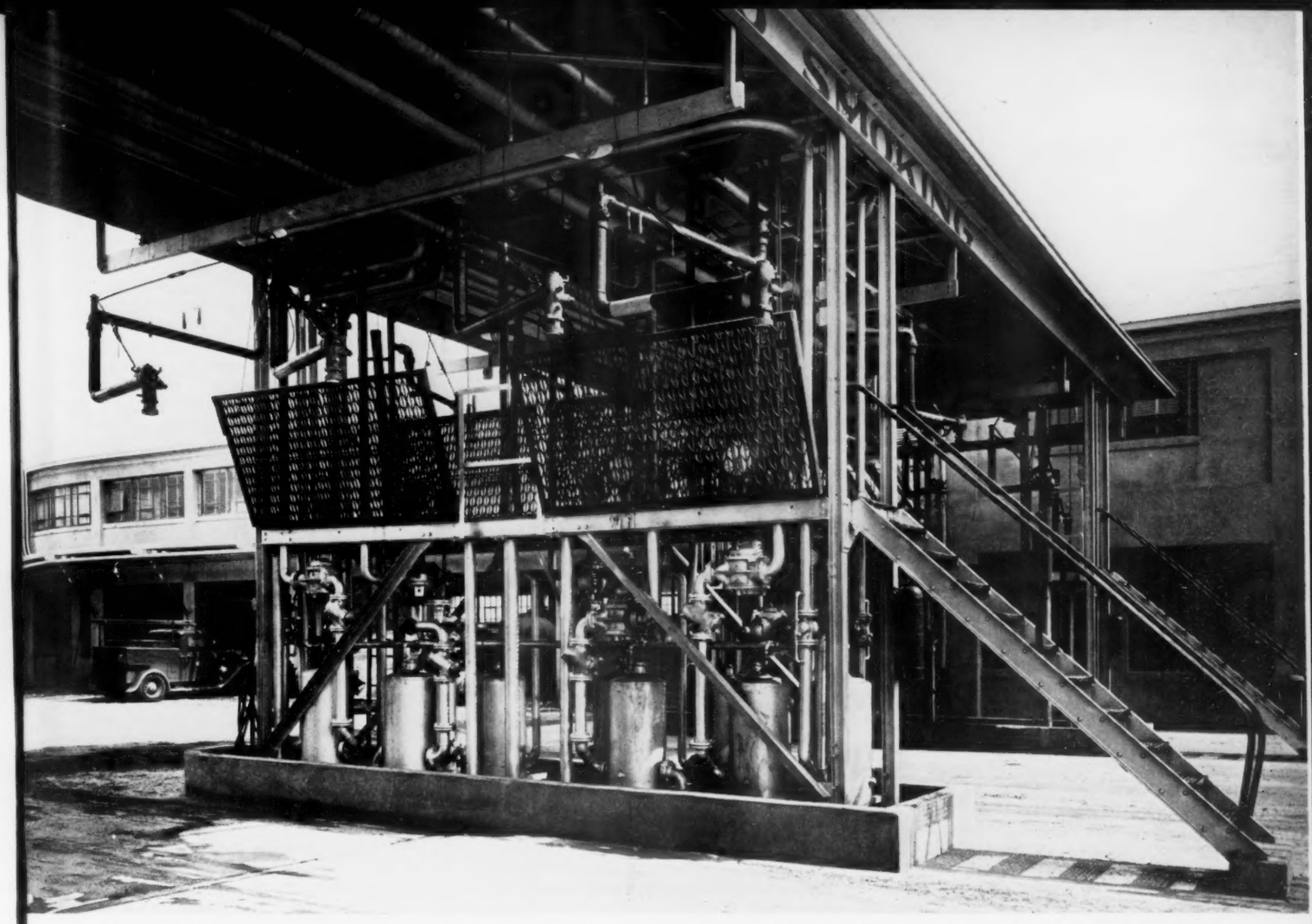


A section of the all-steel, six-lane, loading rack, indicative of the modern efficiency of Shell Oil Co.'s new San Francisco bulk depot. Facilities include,

1. Meters, together with strainers and air separators, for measured loading of gasoline transport trucks, located under the platform and protected by concrete curb—meter dials extending above the platform for ease in reading.
2. Steel-mesh, non-skid hinged and counterbalanced platform extensions used for safety in bridging the gap between the rack and top of the truck tank. The extensions are 4 ft. wide and usually full length of the platform, although one shown here is divided for loading transports.
3. Double swing-jointed loading arms give wide radius action for "one spot" loading of truck compartments.
4. Tube turns and pipe bends in the piping arrangement reduce friction loss in aiding high discharge rates. Piping is shown coming in over top of building at far left of photograph.
5. Electric switches for remote control of pump motors, located on wooden member above and within easy reach of loader. These switches are operated by pull cords shown hanging from elevated support.

Shock Proofing A Bulk Plant—

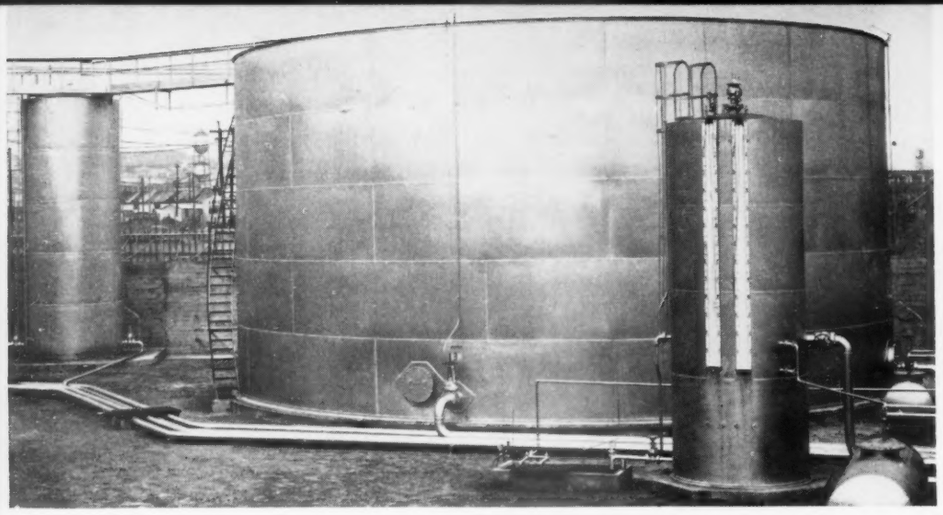
In Addition to Meeting Fire and Safety Precautions, and Today's High Efficiency Standards, When Shell Oil's Engineers Built a New Depot in San Francisco, They Also Had to Provide Against Damage from Earthquake Shock.

Speed in handling products,
Operating efficiency,
Safety to men,
Earthquake-proof construction,
Protection against fire—

These are the five important factors Shell Oil Co. engineers had in mind when they designed and rebuilt on a larger scale a strategic bulk plant in down town San Francisco several months ago.

Essentially new in every important detail, the plant was reconstructed on a site where the company has operated a bulk depot for many years and some of the existing facilities were incorporated into the larger and more efficient layout. The location is at 3rd and Army Sts., within 800 feet of dock facilities on San Francisco Bay.

Complications, which required some interesting solutions of engineering problems were added when the Shell engineers found they had to build a plant on filled ground; 80-ft. piles had



In San Francisco, to reduce fire hazard should gasoline pipelines be ruptured by a severe earthquake shock, fire regulations provide that lines extending outside the bulk plant must be filled with water when not in use. In the new Shell depot, the vertical water "slugging" tank at the right is used in clearing water out of 800 ft. of gasoline line between the plant and unloading dock. It has separate float gauges to show respective levels of gasoline and water. Waste water goes into sewer through concrete pit at left of tank

to be driven and covered with a concrete slab to give adequate support for all major tanks and buildings. It was also necessary to take other unusual precautions.

Ever since the days of the big San Francisco earthquake and fire 35 years ago, the regulations for all construction there have been far stricter than in most towns. Tanks, foundations and connections have to be so built that if another quake should come they will not break under this additional stress.

It is not every day that the engineers for a large oil company have a chance to rebuild a plant from the ground up, with the opportunity to include the latest and most modern in bulk plant equipment and engineering design. However, when these are the conditions of construction, it is interesting to see what was actually done in building a plant with high operating efficiency and safety.

To give the greatest speed and flexibility in handling various products, separate pumps are provided for each. First grade, or regular gasoline, which has the largest throughput, has 2 pumps, with separate discharge lines. There is a separate pump for each of the two other grades of gasoline handled. In addition, 2 pumps are provided for diesel and fuel oil. One diesel pump is used for dock service only, in accordance with fire regulations, and the other for pumping to the loading rack and barrel filling department.

Fuel oil is handled by 2 pumps, one for each brand of oil. Either pump can be used for dock service and both are connected to swing arms at the loading rack. Pump ratings are:

Two for first grade gasoline, 400 and 600 g.p.m.
One each for third grade and premium gasoline, 200 and 400 g.p.m.
All other light oil products pumps 130 g.p.m.
Two diesel, 250 and 300 g.p.m.
Two fuel oil, 250 and 500 g.p.m.

All pumps with the exception of those for fuel oil are located on an open slab at one end of the tank yard and adjacent to the warehouse building. This slab is 1 ft. above the tank yard grade and about 6 ft. lower than the warehouse floor.

Pumps handling fuel oil are located in a combination pump and foam powder storage building in the main yard.

This arrangement was the result of the previous location of a large fuel oil tank adjacent to the main yard.

Designed for a large throughput of products into a fleet of distributing and transport tank trucks, the loading rack at this plant was laid out to provide for the minimum movement of delivery equipment and to give the maximum loading rate consistent with the truck tank size.

Transport equipment operating out of the plant—ranging in capacity from 4300 to 5900 gals.—can be loaded through meters in 15 minutes. The general arrangement of the fillstand is the drive-through type, with 6 lanes.

Lanes No. 1 and 2 have 3 gasoline fill arms with minimum discharge capacity of 200 to 300 g.p.m. These 2 lanes are used for loading local trucks and the spacing of arms is suited to openings in the tanks, to provide one-stop loading.

The third lane has 4 gasoline stems, 2 for first grade, or "regular", and one each for third grade and premium. These fill arms are arranged for truck and trailer loading, each with a minimum discharge capacity of 300 g.p.m.

Six fill arms in Lane 4 handle various grades of light oil products, with capacities of 130 g.p.m.

Four fill arms in the fifth lane provide 2 for fuel oil and one each for stove and diesel oils with capacities of 250 g.p.m.

Two fuel oil stems occupy the sixth lane with capacities of 250 g.p.m.

Meters with air eliminators are installed for transport loading of gasoline and a loading of light oil products. Local deliveries of gasoline are not metered into the trucks, but are metered out into customers' tanks. Meter dials extend above the platform floor.

Loading platforms are approximately 8 ft. above the concrete slab under the fillstand. Each platform has a hinged, open-mesh, metal extension, 4 ft. wide and full length, mounted on each side. These extensions are held in place by cables running over pulleys and attached to counter weights sliding within a light pipe casing under the platform.

When a truck is in loading position the hinged platform is pushed down to a horizontal position, with the outer edge over the truck tank. In this position the counter weight strikes a stop. Arrangement and design of the weights is such that the platform will remain in the down or up position until it is manually raised or lowered.

In order to give a large radius of action for each load arm, two swing joints are used in the sections of horizontal pipe—one installed at the main riser and the other about 4 ft. out. The arm swings in a horizontal plane without any vertical motion.

BOTTOM loading is accomplished by a rubber hose extension which is quick-coupled to the swing arm. This hose reaches to within 1 ft. of the tank bottom. A slow closing valve is mounted at the end of the fill arm, with a push button controlling the pump located overhead within easy reach of the loader, who stands on top of the truck when filling to a marker.

Piping, between pumps in the tank yard and the loading rack, comes in over the top of the warehouse and rack, providing accessibility for inspection at all times. All pipe was welded throughout and all right angle bends were made by pipe bends or tube turns to give the best hydraulic characteristics.

Gasolines, stove, diesel, and fuel oils at this plant are received by barge at a dock about 800 ft. from the depot, and then unloaded through pipelines to the proper tanks. The following size lines were run between the dock and depot for unloading and loading products:

Table 1

2—6" gasoline unloading.
1—3" gasoline for dock service loading.
1—4" stove oil unloading.
1—4" diesel oil for unloading.
1—4" diesel oil for loading at dock.
1—8" fuel oil for unloading and for loading at dock.
1—2½" water for dock service.

The pipelines are parallel and buried about 3 ft. underground in the same trench. As the water in the Bay at high tide is above the pipe, the ground

is often saturated with sea water, necessitating special protection against corrosion.

This protection was provided by coatings of enamel and asphalt-saturated asbestos felt wrapping, applied in the shop except for the joints, which were coated in the field after the lines were welded and tested. The pipes were sand-blasted to remove rust, mill scale and so on, and immediately primed. This was followed by a coating of enamel, a wrapping of asbestos felt and a second coating of enamel.

IRE regulations require the two 6-in. lines to be filled with water when not in use. This is accomplished by the use of a small pump at the dock, through which either fresh water or salt water from the bay can be used. Water in the lines is removed by forcing it into a tank when unloading gasoline from the barge.

Three-way plug valves are used to divert the pumped liquid from the water tank to the proper storage tank after the water is out of the line. A certain amount of gasoline enters the water tank before the switch is completed. The water and gasoline settle and then the gasoline is drawn off and the water, after passing through a separation box, is pumped into the sewer.

Lubricating oil and other light oils are delivered by tank car to the depot. It is also possible with an emergency hookup to unload all products from tank car or truck and trailer. The pump used for this purpose normally serves as the gasoline dock service pump.

Light oil barrel filling is provided at one end of the marquis that extends the full length of the warehouse facing the yard. All light oil products can be filled into barrels, each group of products having a separate meter and air eliminator. When being filled, all barrels rest on a series of flat steel bars set into the concrete platform and properly grounded to prevent static sparking.

Lubricating oils are filled into buckets and drums inside the warehouse directly back of the light oil barrel filling department. Non-drip valves are used for light and lubricating oil filling.

The light oil valves are mounted on a swing arm, with swing joints providing a vertical and horizontal movement. When not in use the arm is held by a hook under the structure that supports the meter and strainer, with the whole unit fastened by brackets to the concrete wall of the warehouse.

Convenience in the handling of buckets while filling with lubricating oil is provided by a series of rollers under the discharge valves. A drip pan under the rollers catches any spillage. Contents of barrels are determined by weighing on a scale located conveniently in the lube filling space.

A series of platforms and stairways inter-connect all storage tanks, as an aid to accessibility in gauging. The new tanks, except those for lubricating and fuel oils, are equipped with automatic gauging and temperature devices mounted on the top of each tank.

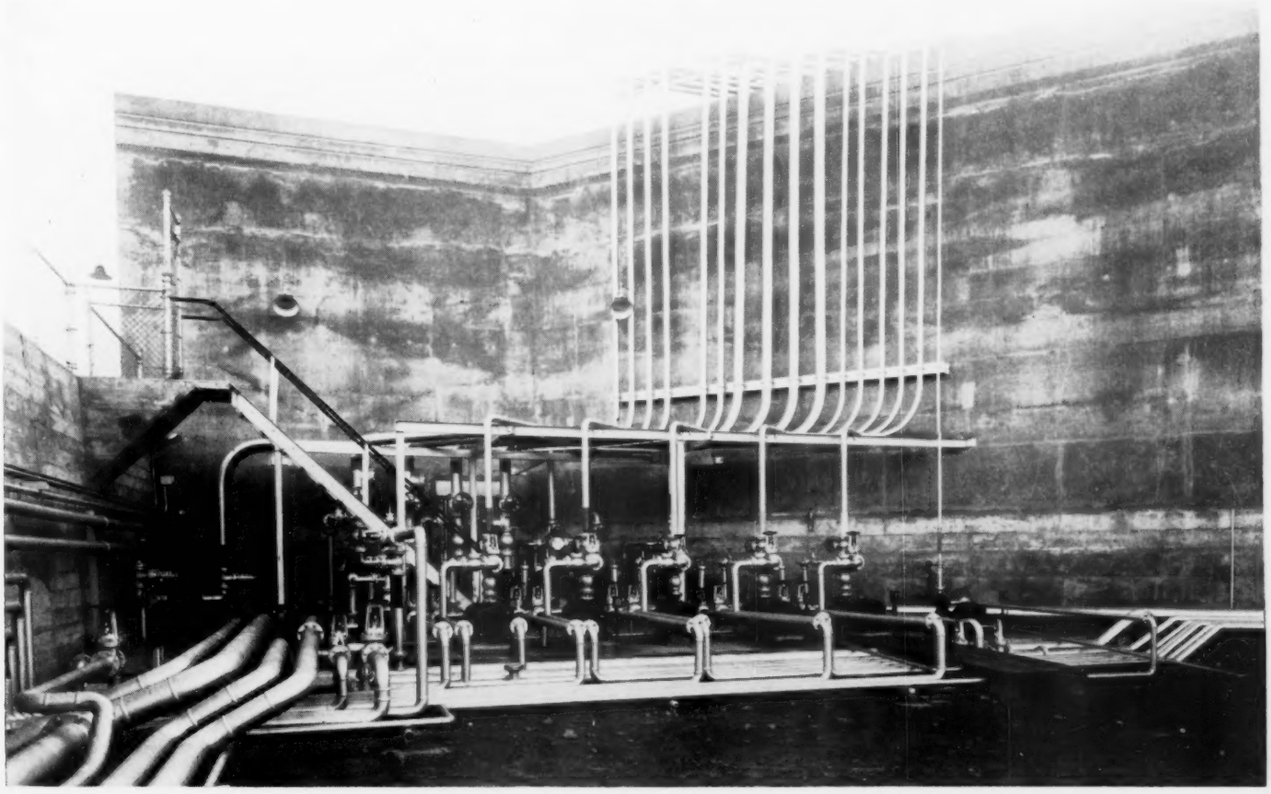
ALL tanks have internal valves, with fusible links designed to close them automatically if exposed to the heat of a fire. Except on lubricating oil tanks, each tank valve is cast steel. Care was exercised in connecting to tanks to give the greatest flexibility in case of earthquake shock without injury to the tank valve.

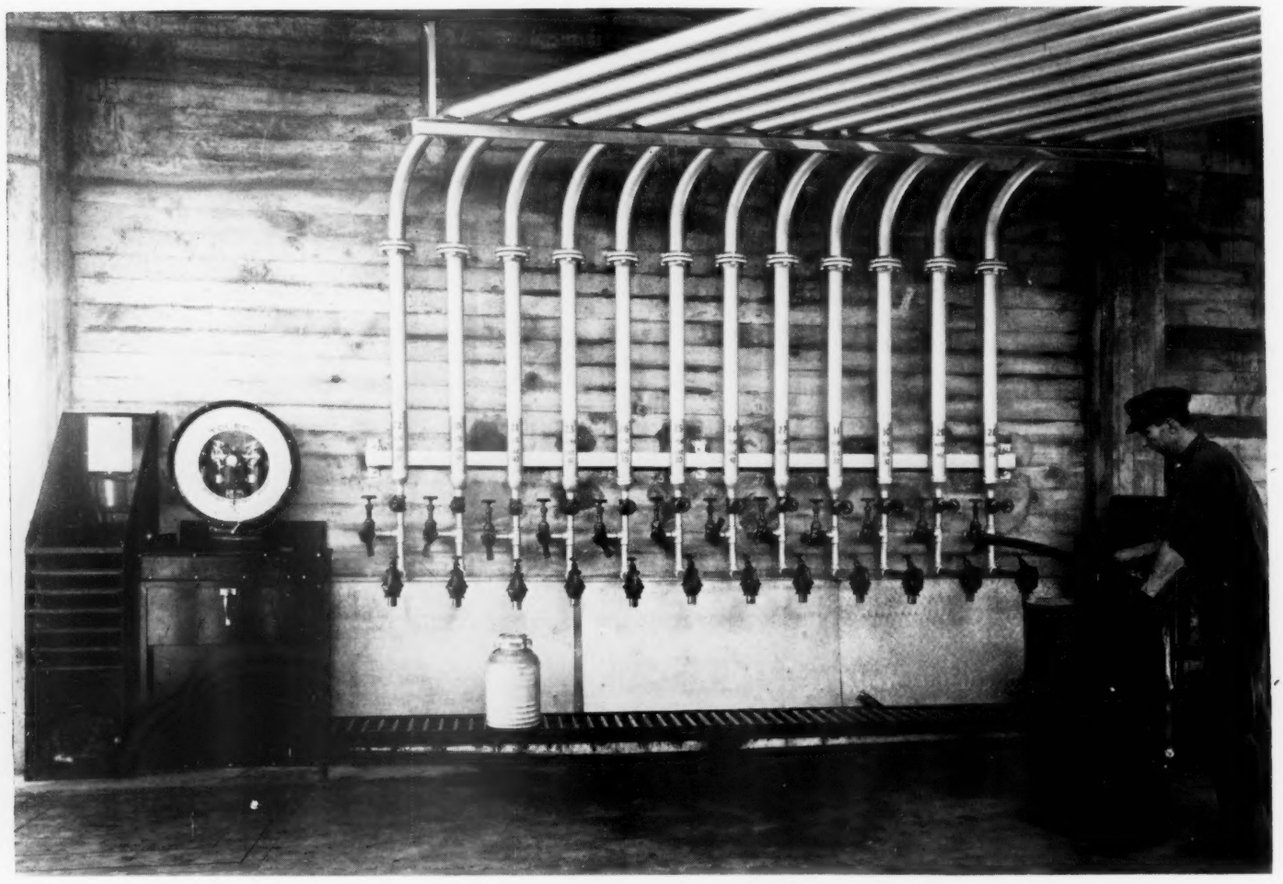
Facilities at the new plant provide storage for 2,000,000 gals. of all products, with space provided for a future increase of 400,000 gals. The warehouse has a capacity of 4000 drums and space is also provided for 1800 empty containers.

The plant site is all on filled ground, with the fill varying from 11 to 30 ft. At one time the entire area was part of the San Francisco Bay mud flats. Original fill material used in the area

• • •

Individual pumps and motors on this open pump slab were selected by Shell engineers for speed and flexibility in handling various products. For ease of inspection and in the solution of construction problems, piping was taken over the top of the warehouse to the loading rack. The pipe is supported by a steel frame above the pump slab and on top of the warehouse. All pipe is welded and all right angle bends are tube turns or pipe bends





Lubricating oil drum and bucket filling department at the new Shell bulk depot in San Francisco. Series of rollers under discharge valves provides convenience in handling buckets. Contents of barrels are determined on scale at left. Pipe bends again featured in making right angle turn with overhead gravity flow lines

had not proven satisfactory even for light loads, so it was necessary to obtain a more solid footing.

After careful study of many factors, the most satisfactory layout for the new bulk plant, from an operating standpoint, as well as for construction, dictated the removal of all existing structures, with the exception of a two-story concrete frame combination garage and storehouse. The existing storage tanks and retaining walls remained and with additional property form a new tank yard.

ACCURATE knowledge of the underlying ground was obtained from borings taken at various points. The result indicated various depths of fill with blue mud and sand below. A very hard layer of beach sand exists about 80 ft. below the surface.

Conclusions reached were that piles would be necessary for large loads, the soil being good for about 1000 lbs. per square foot. This required the use of 80 ft. piles under all major tanks and buildings.

All tanks over 25,000 gals. capacity were supported on a pile foundation. The piles were cut off at the ground line and capped with a reinforced concrete slab, making the slab 9 inches above the tank yard. All tanks were set on a bed of oiled sand placed on top of this foundation.

To comply with building regulations, a reinforced concrete warehouse was decided upon. The building is 80 ft. wide and 180 long. The outline is somewhat irregular to fit in with the existing buildings and tanks. The rear wall of the warehouse forms the retaining wall for the adjacent tank yard.

• • •

Interior columns were not considered an operating hindrance and would give a more economical building for the poor soil conditions. Bays were spaced on 20 ft. centers and each bay had two interior columns with center spacing of 31 ft. The building columns were designed to carry only the roof and wall loads.

Floor load of the warehouse is carried directly on the ground. To give adequate column support for horizontal forces due to wind and earthquake shock a complete concrete tie between all columns was placed at a point 3 ft. below floor level.

The clearance between floor and the girders and beams supporting the roof was set at 14 ft. minimum, to allow for stacking barrels when conditions demanded additional storage space.

A feature of the plant is provision for gravity handling of lubricating oil bulk stocks. Storage for these products is provided by tanks elevated 10 ft. above the warehouse floor level and supported by a reinforced structure adjacent to the warehouse building. The supports consist of a beam and girder platform without a slab—to reduce the dead load. Space under the tanks is used for empty drum storage.

Because the new yard level was raised about 4 ft. above the previous grade, it was necessary to raise the existing concrete building. This was accomplished by cutting off the concrete columns at the ground line and welding new steel to the column bars for added height.

FILL was added and a new slab poured at the proper elevation. This building, 37 x 100 ft. and a 30-ft. addition, became the garage and office. Office space is on the second floor with operating offices on the first floor together with the garage and repair shop. The first floor offices are for personnel engaged in yard operations at the depot.

In addition to a supply of hand-operated first-aid fire fighting equipment, the plant is provided with portable foam generating apparatus and a large stock of chemicals for fighting major oil fires.

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If you are burning your cracked gas in the refinery you know how much it is worth as boiler fuel

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Universal Oil Products Co
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Oil Expo Will Unveil Newest in Equipment

W. G. Skelly, head of Skelly Oil Co. of Tulsa, who has been president of the Oil Expo since 1927

The International Petroleum Exposition—the greatest exhibit in the U. S. by any single industry—May 18 will open its gates to record another chapter in the story of the progress of this $13,000,000,000 industry in developing more efficient and safer equipment and methods, to carry on its operations.

The Expo is held on its own grounds of 25 acres in Tulsa. The show runs through May 25. It is held every two years, this is its eleventh.

The oil marketer will be able to walk through the grounds and study the latest in tanks, pumps, trucks and other equipment that is offered to aid him in carrying on his own business profitably. At the same time he will be able to get a vivid picture of the new methods and equipment other branches of the industry are using. The refiner, transportation man and the producer likewise can not only learn more about his own special field but also more about what other branches of the oil industry mean to him and his success.

The general public will have the opportunity to walk through the Expo gate, right into the heart of the oil industry, so to speak, and catch something of the spirit that has brought about its tremendous development in the last quarter-century. It will learn of the industry's success in improving its products and yet lowering their cost to the public; in providing the equipment necessary to meet continually more severe operating problems and always at increased efficiency; and in making working safer, until the average workman is in less chance of injury on the job than in his own home.

The Expo is now so well known as the place where the newest ideas in oil industry operations and methods are known that engineering students from many universities in the southwest attend. This year there will be one special day for this class of visitors. They will be guests of University of Tulsa's School of Engineering and, if they desire, they can "attend class" on the grounds, under the direction of Dean R. F. Lanfenheim of the Tulsa school.

Among the features at this year's Expo will be:

Selection of the "grand old man" in each branch of the industry. The grand old man of marketing—on the basis of length of service and his contributions to that branch—will be honored. So will be the grand old man of refining; of transportation, and of production.

Honoring of the "safest" individuals in the industry. Awards, with watches as prizes, will be given to the individuals having the best accident-free records. The individuals will include foremen, supervisors and drivers of company-operated trucks and cars in all four branches of the industry.

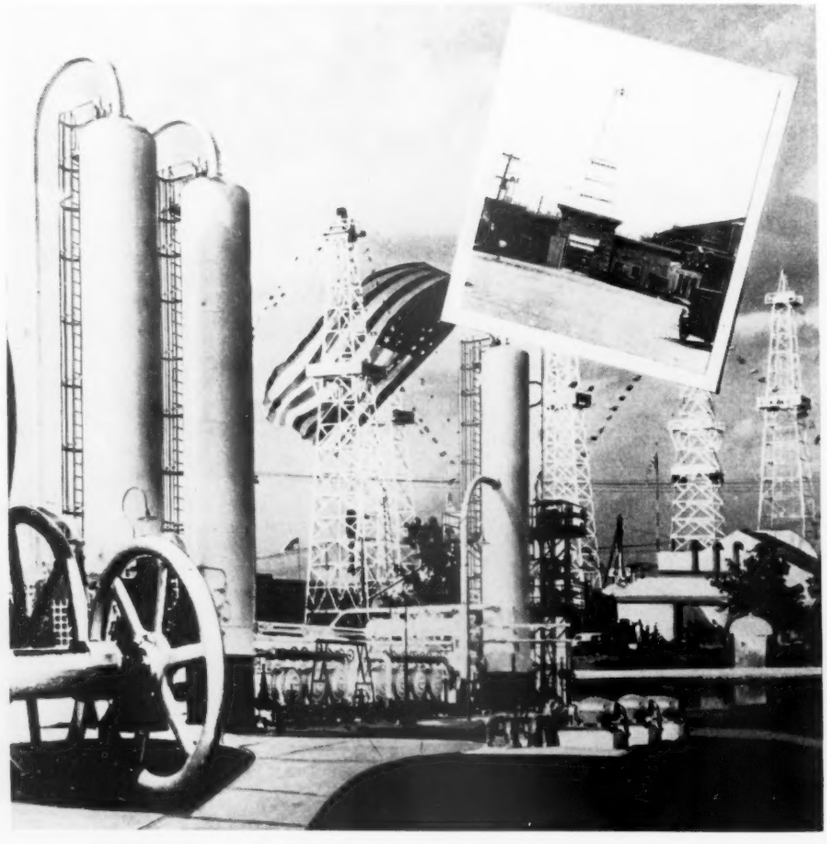
As for the Expo itself, it promises to set a new record. Virtually every available exhibit site has been leased, which means that well over 600 exhibits will be shown by some 800 exhibitors.

Ten new buildings are being erected by exhibitors. This will make a total of 36 buildings on the grounds owned by exhibitors.

A new feature this year will be the foreign delegates' building being erected by the Nomads Club. This organization is composed of oil men who have seen service in foreign countries. This club will entertain the official delegates to the Expo from 18 foreign countries.

This year, no oil associations will hold meetings in Tulsa during the period of the oil show, as was done formerly and visitors will be able to give their entire attention to the Expo without outside attractions.

At the head of the International Petroleum Exposition is W. G. Skelly, of Tulsa, head of Skelly Oil Co., who has served as president since 1927. General manager for some years has been W. B. Way, of Tulsa.



A small part of the exhibits at the 1938 Tulsa oil exposition. Inset is the entrance to the first International Petroleum Exposition, held in 1923. There were 26 exhibitors then; now there are 800

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Evaporation Losses At Bulk Plants More Costly With Today's Gasolines

H. C. Conners

By H. C. Conners*

Present-day gasolines, with their higher anti-knock properties, greater volatility and fast starting characteristics, have cast a new spot light on the need to conserve the volatile and important gasoline vapors. This need is most important at the bulk plant, if full value of the fuel is to be realized.

Economic consideration of the evaporation problem today must go beyond the out-of-pocket cost represented by the million of gallons of gasoline lost to the air. Emphasis now is on the depreciated quality of the new improved motor fuels, which results when the lighter gasoline ends—most subject to evaporation—are lost and remove those constituents so necessary to better gasoline performance.

Practical significance to the independent oil marketer of the evaporation problem, its cost, effect and solution, particularly as it applies to the storage and handling of today's gasoline at small and medium size bulk plants, was discussed before the Michigan Petroleum Assn. at Detroit April 4, by H. C. Conners, conservation engineer, Graver Tank & Mfg. Co., Chicago. The principal portion of his paper is published here.

EXTENSIVE research has developed the fact that, as far as gasoline is concerned, four important factors govern the rate of speed at which liquid will be evaporated, and the control of one or more of these factors is necessary if we are to eliminate or reduce this process within our storage tanks. These factors are as follows:

1. Temperature of the surface of the liquid.

2. Quantity of the same vapor in the space above the liquid.

3. Area of the surface of the liquid presented for evaporation.

4. Renewal of air over the surface of the liquid.

A rise in temperature of the liquid in tanks, caused either by direct transference of the sun's heat through tank shell to the liquid, or transference through the shell to the vapor above the liquid, and thence to the liquid, causes a rise in the vapor tension and increases the rate at which the particles will pass from the liquid to the vapor space. Obviously, the temperature at the free surface of the liquid, where molecules can escape into the space above, directly affects this speed of vaporization.

As the vapors above the liquid approach the saturation point, the speed of vaporization slows down, and since only a certain quantity of vapor can exist in a limited space at a given temperature, the presence of some vapor above the liquid will retard this action.

It is not difficult to see how a large expanse of free liquid surface will offer escaping points for more particles than a small confined surface. In a vertical tank, this surface never changes, but in a horizontal tank at its 50% full point, considerably more surface is presented than in a vertical tank of the same size.

The horizontal tank will present a lesser surface, however, when it is nearly full, or nearly empty, but in the latter case, considerably more space will exist above the liquid. There seems to be a consensus of opinion among authorities on this subject that there is very little difference in the rate of evaporation between the two types of storage.

Rapid renewal of air over the evaporation surface causes vaporization to go on at a very high speed, since as the particles escape from the liquid to the vapor state and are carried away, the fresh air being passed over the surface of the liquid offers no resistance to the escape of these particles.

Knowing that this process of vaporization goes on at all times in the tanks, we find that there are three methods by which the rich vapors are wasted to the atmosphere:

1. Breathing

2. Filling

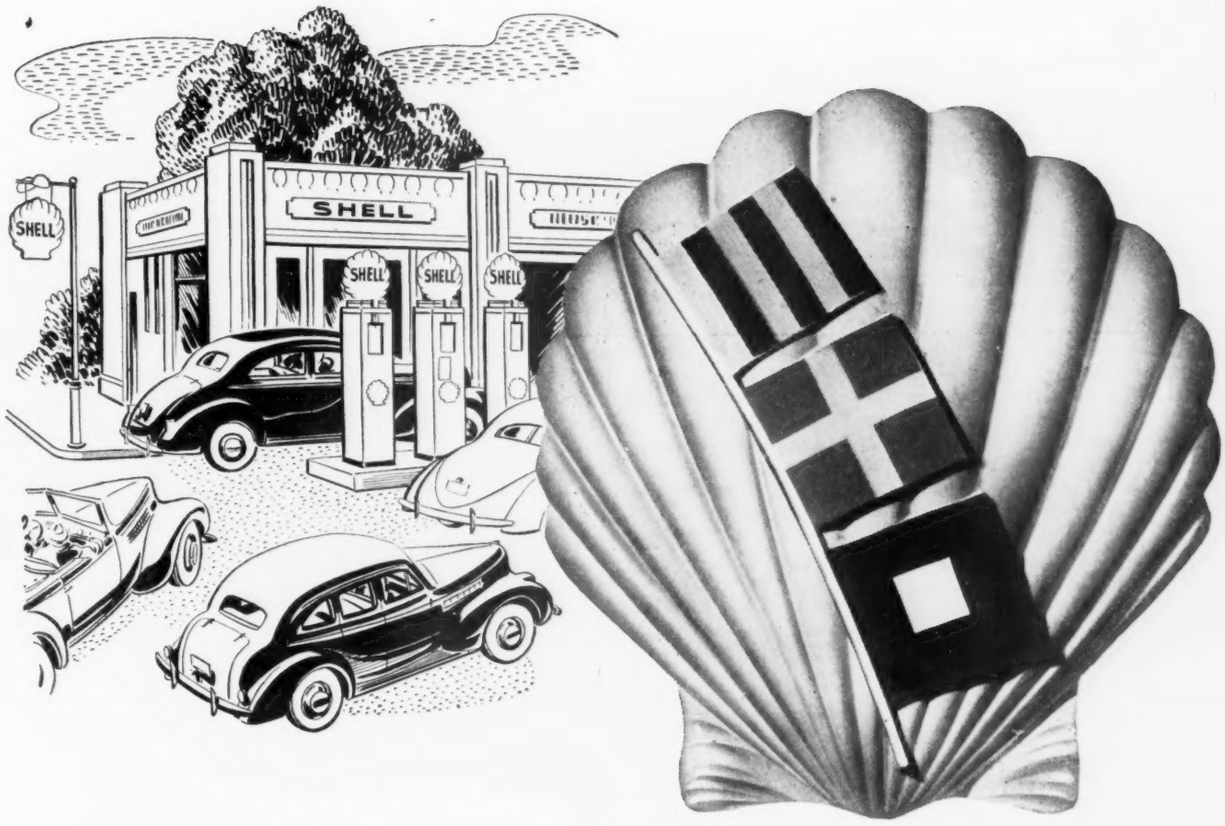
3. Loading

By breathing, we mean the action which takes place when increases or decreases in atmospheric temperature or pressure cause vapors within a tank to be expelled or cause fresh air to be drawn into the tank. During the day the sun's heat is transferred through the tank shell to the liquid and to the air vapor mixture above the liquid.

This heat causes a thermal expansion equal to the final temperature absolute over the initial temperature absolute, plus a rise in the vapor pressure. The vapors are forced out through the vents or leaks in the tank or fittings above the liquid level, until the pressure within the tank is reduced to atmospheric.

At night, the decrease in temperature causes contraction of the air vapor mixture within the tank with a consequent drop in pressure, and fresh air is drawn into the tank on the vacuum side of the vent. This fresh virgin air takes on vapor and is ex-

*Conservation engineer, Graver Tank & Mfg. Co., Chicago.



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SHELL'S SHARE-THE-ROAD CLUB is the Shell dealer's greatest guarantee of steady gallonage.

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Millions of cars carry the emblem of the Share-the-Road Club . . .

Each car stopped at a Shell station to get this emblem . . .

The car owner left his name and address with the dealer when he joined the Share-the-Road Club . . .

And almost every time, he bought either gasoline or motor oil or both.

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BUT MORE IMPORTANT — dealer and car owner met under the best possible circumstances . . . **DRAWN TOGETHER** by their common interest in fighting a nation-wide nuisance . . . ***Stop-and-Go driving.***

The Shell dealer offers the motorist two distinctive and exclusive weapons against Stop-and-Go . . . *the Share-the-Road Crusade* to cut the AMOUNT of Stop-and-Go . . . SUPER-SHELL to cut the COST.

Such strong selling advantages are rare indeed in the oil industry.

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This is only one of a series of strategic moves which bring Shell dealers and their customers together on a basis of mutual interest . . .

THE SHARE-THE-ROAD CRUSADE is more than printed advertising . . . it is a Dealer-Participating, Customer-Participating Plan which is making the SHELL FRANCHISE more than ever an asset to be sought after and retained.

For further information concerning the details of what Shell has to offer, we suggest that you talk to a Shell representative today.

SHELL OIL COMPANY
INCORPORATED

pelled the following day in the same cycle.

When empty tanks are filled, the liquid displaces the vapors through the vents, as it rises in the tank, causing an additional loss. We have conservatively estimated this loss to be approximately .14 of 1% of the total throughput, based on average tanks of all sizes. On small tanks it may run up considerably higher than this figure.

An additional loss occurs when filling truck tanks by the over-shot method. As gasoline passes out of the unloading spout or hose, splashing into the interior of the tanks, a fine spray accompanies this splashing action and a quantity of gasoline is evaporated. This loss has been conservatively estimated to be approximately .4 to .7 of 1% of the amount handled.

We might stop for a moment and consider our present-day gasoline. Today, we have in this country the finest gasoline in the world, famous for its fast-starting and anti-knock qualities, but also notorious for its volatility or its ability to get away from us.

The gasoline today is as different from the gasoline of yesterday, as the automobile of today is different from those in existence several years ago. The vapor pressure of the product has been increased at the rate of approximately 0.25 lb. per year and the millions of dollars spent in improving and developing new methods of refining has resulted in the manufacture of this lighter product, with the "battle of the octanes" we are witnessing today.

In comparison to the vast sums expended towards the manufacture of a product of better quality, little has been expended toward the development of apparatus to maintain the quality from the time it leaves the refiner until it reaches the ultimate consumer.

Large refiners, both from an economical standpoint and in order to maintain the quality of their stock, were forced to make large investments in devices such as pressure tanks, floating roofs, breather roofs and expansion roofs. The smaller independent marketers, however, have in most cases, gone along using the same equipment which was in use 5, 10, 15 or 25 years ago, and which in reality is quite as obsolete as the motor car of that period.

A great many of us are actually unaware of what these losses amount to over a period of time. Extensive research conducted in over 250 representative plants indicates that the actual loss from breathing alone in tanks up to 30,000 gallons will vary from 8% to 12% of the tank's capacity per year.

ADDED to this is a filling loss of .14 of 1%, truck loading losses, and other unclassified deficiencies. Yet, the average operator seems to be of the opinion that his loss is only from .5 to 1.5 or 2%. The reason for this deception is the relatively large coefficient of expansion of gasoline. Products of 51° to 64° A.P.I. gravity expand approximately 1% for every 16 2/3° rise in temperature.

We buy our product corrected to 60° yet we resell it on a strictly measured gallon basis. Most of us know that we have overages in the summer time and feel that our loss due to evaporation during the hot months of heavy consumption is balanced by these overages.

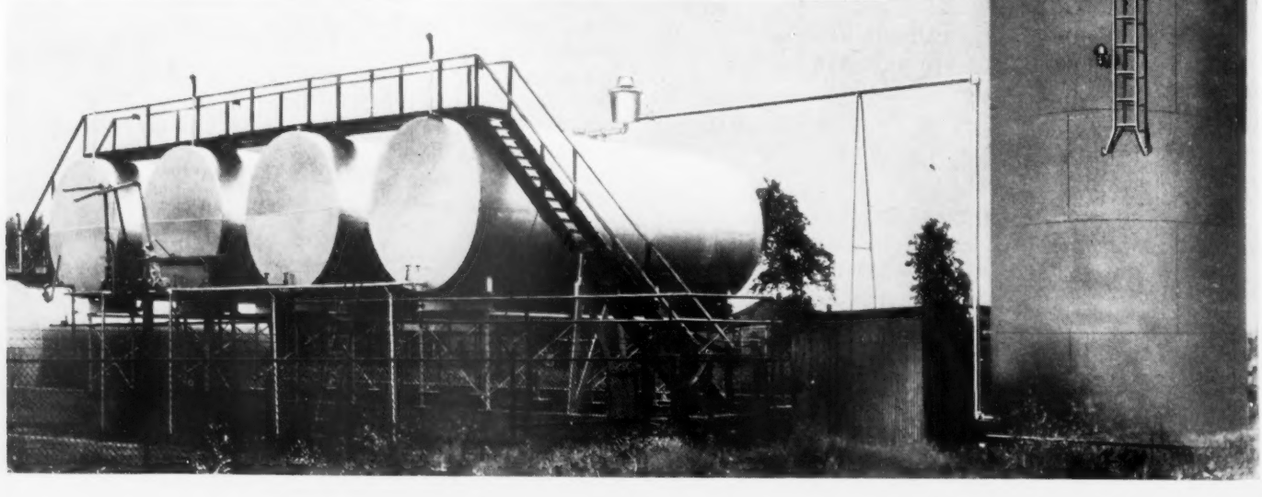
We also feel that shrinkage during the winter is balanced in part by the overages in summer and the fact that there is less loss by evaporization during the colder weather. This would perhaps be partially true if it were not for the fact that gasoline vapor pressure is changed from 9 lbs. in the summer to 12 or 14 lbs. in winter. The increase in volatility causes almost as much loss by evaporization in the winter, even though the temperature changes occur at a much lower range than in summer.

In any event, all of us know that what we don't have to sell, we can't realize a profit on. Where we pay a tax on our commodity the minute it is put into our bulk storage, we should estimate our losses at the tank wagon price.

Some idea of what evaporization loss is costing all of us can be gained from figures issued by the U. S. Bureau of Mines, a well known authority. This bureau estimated conservatively that approximately 237,000,000 gallons were lost through evaporization in 1932. In 1937, this amount had jumped to 328,000,000 gallons and during the coming year will probably be close to 500,000,000 gallons.

Multiplying this by the cost of our product, we can see how large is this jack pot to which we are contributing. At a tank wagon price of 6 cts. a gal. this amounts to approximately $30,000,000 per year, or about $1 per year for every motor vehicle in this country.

Here are some of the things that can be done around the average bulk plant



Variable volume container at right, which contains an interior fabric diaphragm or bag, is connected by pipeline with the group of horizontal storage tanks at left. Volatile vapors above the stored liquid breathe in and out of this container rather than into the air, reducing evaporation loss

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KOOLMOTOR Gasolene is known and used by millions. Advertising of this product on the road reminds the driver that he needs a refill, persuades him to turn into the next Cities Service Station where he knows he can get this product.

Cities Service makes dramatic and effective use of radio, newspapers, national magazines. The story of its products and services told in these media, results in a success story of profitable operation. In addition, lively promotions and special merchandising events are featured — all supplemented by expert personal assistance.

All the power of this advertising, and all the advantages of the complete Cities Service selling campaign can be yours. Why not put some of this sinew and muscle into your business? Contact the nearest office listed below for full details.

• **TO HELP BUILD SALES** Cities Service Radio Concert—with Lucille Manners, Ross Graham, Frank Black and the Cities Service Orchestra and Singers—Friday evening at 8 p. m., E.S.T., over NBC Red Network.

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CITIES SERVICE OIL COMPANY—Chicago, New York, Cedar Rapids, Boston, St. Paul, Grand Forks, Kansas City, Fort Worth, Tulsa, Milwaukee, Cleveland, Detroit, Syracuse, Harrisburg.

CITIES SERVICE OIL COMPANY, LTD.—Toronto, Ontario.

ARKANSAS FUEL OIL COMPANY—Shreveport, Little Rock, Jackson, Miss., Birmingham, Atlanta, Charlotte, N. C., Nashville, Richmond, Miami.

to reduce evaporation losses, which can be done without great expense and which will do much more than repay the required effort:

Ways to Save Losses With Present Tanks

1. **Clean valve seat of mechanical vent.** Grit and sand on the seat of vent valves will often prevent their proper operation, permitting vapors to escape freely and fresh air to enter the tanks. When valves become defective in this manner, they are just as bad as no valves at all. Cleaning the seats once a month or every two months will insure their proper operation.

2. **Leaks in tank fittings, or lines.** Distortion of tank plates caused by settling of foundations, or excessive pressures due to sticking valves, or valves set at pressures beyond normal design of the tank, often will cause pinhole leaks at the seams or fittings and permit the escape of vapors. This is particularly true of the old type riveted tanks, but happens also with welded storage.

   Leaks of this kind can most easily be detected by the application of a soapsuds solution with a small brush at the seams, around the fittings and connections during the warmer period of the day when some pressure is on the tanks. Bubbling of the solution at any point indicates a leak and repair is necessary if economy is to be effected.

   Caulking of storage tanks leaks should be done by experienced tank repairmen, as this operation is sometimes hazardous, but in some instances leaks may be stopped for a considerable period of time by the application of compounds on the market for this purpose. Tanks beyond repair should be replaced with new vapor-tight storage, for the savings effected will, over a reasonable period of time, repay amply the investment involved.

3. **Installing vapor-tight gauging apparatus.** Many jobbers still open the top of their tanks to gauge and in so doing release gasoline laden vapors to the atmosphere. There are on the market today gauges which permit reading of the liquid level in the tank without permitting the vapors to escape. One of the most practical of these vapor-tight gauges has a little knob near the reading glass which actuates the tape and permits inertia of the float to be overcome; raising it off the liquid, then allowing it to settle back so that an accurate reading can be obtained.

4. **Painting tanks and lines.** Tanks and lines painted with aluminum or other light reflecting materials will reduce the transference of heat to the liquid and thus retard evaporation.

5. **Inspection of pumps and fittings.** Replacement of worn pumping parts, union gaskets, and leaky fittings obviously will decrease losses at the bulk plant.

6. **Subsurface loading.** Devices for subsurface loading can be installed at a small cost and will effect approximately a .25 of 1% reduction in loss of the amount handled from over-shot loading. Some of the newer truck tanks being built have a ball and socket connection with a surface fill pipe built into the truck tank, thus eliminating the loss of any of the product that might ordinarily adhere to the common subsurface loading tube.

All of the above operations are worthwhile and will do a lot toward reducing evaporization loss at a bulk plant.

Editor's Note

At this point in his talk, Mr. Conners discussed a new piece of conservation equipment designed for the average marketer, which is the result of extensive scientific and practical research by manufacturers and oil company engineers. Known as a vapor container of variable volume, it was designed to control evaporation in the average small bulk plant, providing simplicity of operation and installation, and sufficiently low in cost to repay the investment in a reasonable length of time.

Steps in the development of this apparatus included experimentation which showed that for almost all parts of the country—on the basis of an average 50% inventory, the air vapor mixture above the liquid in tanks up to 30,000 gallons, would expand approximately 36% maximum of its volume, and that this expansion was caused by both thermal action and rise in vapor pressure.

Since volume, temperature, and pressure are interrelated, it followed that a change in any one of these factors causes changes in the others. Converting 36% change in volume into terms of pressure, it was developed that the tanks would have to be kept under 5 lbs. pressure to eliminate all breathing loss for the conditions previously described.

But since the tanks in the average bulk plant today are designed to operate at or below 16 oz. pressure, the application of 5-lb. valves is hardly practical, the speaker said. However, he pointed out that for new installations, pressure-type bulk storage tanks have been designed and constructed to operate at 5 lbs. pressure, with their cost approximately 35 to 40% above the cost of common vapor tight storage. Obviously, application of pressure is not the most practical solution of this problem, however, for the average operator whose tanks range in age from one to 25 years, Mr. Conners said.

Consideration of the temperature factor showed that its control presented even greater difficulties than control of pressure. While light colored paint helps, it does not solve the problem. Insulated housings for tanks are expensive and do not offer a complete solution. Cooling or refrigerating systems are obviously costly and subject to rapid deterioration and breakdown.

For a solution of the problem, this left only the factor of volume to be considered, and directed the experiments toward a method which would permit vapors to expand with a rise in temperature without allowing them to build up a pressure to exceed the vent setting and thus escape to the air.

This study, the speaker said, led to development of the variable volume vapor container. In its operation, all tanks are connected to a common header, which conducts the vapors to a vapor reservoir which is about the size of vertical storage tank.

Construction of this reservoir was declared similar to that of a storage tank, except that a fabric diaphragm or bag operates within the steel shell. This fabric is impervious to gasoline or gasoline vapors. It rises or falls as vapors in the tank expand or contract.

The fabric is attached to the steel tank shell in such a manner that wear is kept to a minimum, the speaker said, adding that wear tests indicate a life of 18 to 20 years.

"As the vapors expand during the day, instead of being wasted to the atmosphere through the vents in the common manner, they are conducted to this reservoir which stores them until the pressure in the tank drops. Then when under normal conditions, fresh air would be drawn into the tanks through the ordinary vent valves, the reservoir returns the vapors to the storage tank. After the initial saturation of vapor within the system, further evaporation does not take place and breathing loss is entirely eliminated," the speaker said in describing the operation.

He pointed out that manifolding of several tanks together does not affect the color of the products, since the dyes will not vaporize. Likewise, quality of the product is not affected, since very little condensation takes place within the system. Another advantage claimed, is that with this closed system no vapors are vented around the tanks, eliminating fire hazards and making for safer operation.

Since the system operates at a very low pressure (not over 2 oz.), it is described as suitable for application to existing storage, provided such storage

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will stay tight at this low pressure. Where tanks already in existence will withstand greater pressures, it is possible to install an expander valve in the vapor line between tanks and the reservoir and so maintain the tanks under whatever pressure they will safely and conveniently stand, it was stated.

Questions and Answers

Mr. Conners then posed 5 questions generally asked in connection with the conservation problem, and answered them, as follows:

1. **Q.** What difference in evaporation loss is experienced in the three common types of storage—horizontal, aboveground, vertical aboveground and underground?

   A. It was previously mentioned that indicated loss in the common type horizontal and vertical aboveground storage is very much the same. In a vertical tank, although the bottom rests on the ground and is cooler, a portion of the shell directly in contact with the liquid is always exposed to the sun, and the transfer of heat through the shell directly to the liquid, will cause a much more rapid rise in the temperature of this liquid than if the heat had to penetrate a layer of air or vapor before it reaches the liquid—such as is necessary in most horizontal tanks when about 50% full.

In underground storage, the liquid temperature will lag from 10° to 15° from atmospheric. In summer, liquid in underground storage will, unquestionably, be cooler than that in aboveground storage, but it must be remembered that the withdrawal of tank's contents causes warm air to be taken into the tanks, and this warm air will heat the liquid in the usual manner.

In the winter time, of course, the temperature in underground tanks will be in average conditions, somewhat above atmospheric temperature or temperature of the liquid in aboveground tanks.

One disadvantage of underground tanks is the fact that leaks cannot be as easily detected as in storage aboveground, nor can they be repaired except by excavation and digging up the tanks. Another disadvantage and occasion for loss occurs when underground tanks are filled through the common fill pipe attached to the top of the tanks. This permits the gasoline to splash, causing turbulence and a spray of fine gasoline particles as it is pumped into the tank. Some of this loss can be eliminated by subsurface fill pipes.

Seepage of water into underground storage is common and may reduce the effectiveness of the gum formation inhibitors included today in most gasoline.

2. **Q.** Does a rapid turnover eliminate evaporation losses?

   A. Rapid turnover will increase the number of times the tank is filled; thus increasing the amount of vapor displaced by this filling operation. The constant pumping in and out of liquid also causes a turbidity, which tends to break the gasoline up into fine particles and vaporize it more quickly. Thus, rapid turnover should not be taken as a solution to this problem.

3. **Q.** How much do common pressure and vacuum vent valves used by the average jobber today retard breathing?

   A. We know that all free air exists under a pressure of approximately 14.7 lbs. per sq. in. under average conditions. This means that, in a tank with an open vent, the percentage of vapor air mixture in the space above the liquid that will be breathed to the atmosphere for any particular rise in temperature, will be the difference in vapor pressure at the initial and final temperatures divided by the atmospheric pressure.

Take for example the average 9 lb. summer gasoline. At 70° the vapor pressure of this gasoline is 5.65 lbs. At 100° the vapor pressure is 9.60 lbs., or a difference in vapor pressure of 3.95 lbs. per sq. in.

Dividing this by 14.7 lbs. (atmospheric) we obtain the percentage of expansion of the vapors due to the increase in vapor pressure and the result is 26% expansion.

In addition to this we have a thermal expansion, which is found by dividing the maximum absolute temperature by the minimum absolute temperature. We change the initial and final temperatures to absolute by adding 460° to each, and this gives a maximum absolute temperature of 560° against a minimum of 530°. The maximum divided by the minimum gives 1.06 or 6% of the volume. Adding this to the 26% found above gives a total expansion in this instance of 32%.

The pressure that would be exerted within a tank for this expansion would be 32% x 14.7 or 4.71 lbs. per sq. in. Assuming that our tanks are equipped with 1 lb. vents, only 7% of this expansion would be retained and the remaining 25% of the volume of the air vapor mixture above the liquid would be breathed to the atmosphere.

From this we can see that with present day gasolines, vent valves, even though perfect in operation, retard breathing very little at the higher temperatures. It does no good to put a 5 lb. vent on a tank designed only for

1 lb. because, as previously mentioned, too great stress is placed upon the seams of the tank and causes pinhole leaks to develop, which leave the tank in worse condition than before. It is essential, however, that whatever valves are used operate effectively, for tight valves will stop some of the breathing at the lower temperatures.

4. Q. What effect does evaporation loss have on the quality of the products in storage?

A. A small loss in product by evaporation has a very deleterious effect upon the quality of the gasoline, because it permits the escape of the lighter ends, causing a drop in octane and vapor pressure and a rise in the 10% point on the A. S. T. M. distillation curve.

For instance, in a tank where a 2% loss has occurred on a gasoline with a 9 lb. Reid vapor pressure, the follow- will result:

1. 9° rise in the 10% point of the A.S.T.M. distillation curve.
2. 1.6 lb. drop in vapor pressure.
3. Two point drop in octane rating.

It is easy to see that in some cases, though the customer may be charged a premium for what is supposed to be premium gasoline, he is actually not getting value received where the product has been allowed to deteriorate in unprotected storage.

5. Q. What return can I expect on my investment?

A. Actual figures taken at plants where expenditures were made for modern conservation equipment and repair of existing equipment in accordance with approved methods, indicated a return of approximately 35% to 50% per annum on the investment involved. From this we can certainly see that money spent toward improved efficiency in operation will earn for us a lot more than it will in the bank; what with dwindling margins, every penny counts, and the elimination of the "evaporation tax" will show up on our balance sheet at the end of the year."

In conclusion the speaker said a "bottle-tight" gasoline storage plant, from the standpoint of losses in the liquid and vapor states, would accomplish the following:

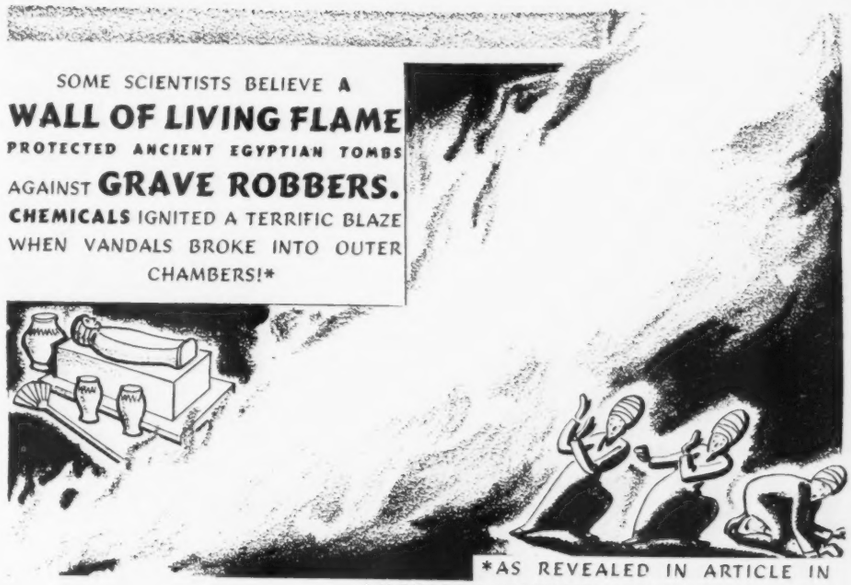
1. Actual evaporation losses occasioned by breathing, filling, gauging, and loading will be greatly reduced or eliminated.

2. Fire hazards due to escaping vapors in the vicinity of tanks and pump house will be eliminated.

3. Alibis for theft or carelessness now charged to evaporation loss will be removed.

4. Quality of the stored product will be maintained from the time it is received until it is marketed.

Strange Facts about Fire!



*AS REVEALED IN ARTICLE IN **AMERICAN WEEKLY**, SEPTEMBER 10, 1939

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New Factors Will Influence 1940-41 Heating Oil Markets

FUELING 225,000 to 250,000 new oil burners to be installed in 1940, an increase of 12% or more in total number in use.

Approaching the close of the current heating season with 1,500,000 bbls. less gas oil and distillate fuel oil in storage March 31 than a year ago.

Facing the possibility of another "cold" winter. This one in reality was about normal for temperature, and was only "cold" compared with the abnormally warm three past winters.

Recognizing that 14,000,000 bbls. more gasoline is in storage March 31 than a year ago, which may affect the scale of refinery operations this summer, when heating oil stocks are built up.

Recognizing that high tanker rates and war demand for tankers may affect the movement of heating oils from Gulf Coast refineries to the north Atlantic states and New England, which is about half the heating oil market, in volume.

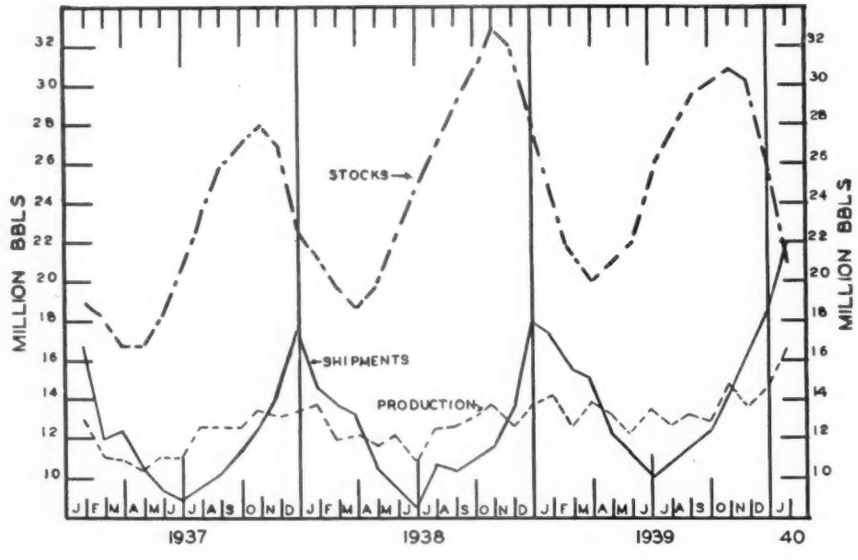
These are all factors that marketers of heating oils will keep in mind in coming weeks, as they do their planning for the 1940-41 heating season.

Early in January it was estimated by one authority that 234,000 new oil burners would be installed by the start of the next heating season. In 1939 there were 247,000 new burners put into homes and other buildings. Sales for the first two months this year by manufacturers were 50% larger than the first two months of 1939, but it was not believed that this rate of output from burner factories would continue.

A conservative estimate of 225,000 burners installed by the start of the coming heating season would bring the total number of burners in use to 2,130,000, which is over double the number in use in 1934. Average consumption per burner during the heating season (September to May) is estimated as 2300 gals.

It is estimated that the total stocks of gas oil and distillate fuel in this country on March 31 were 18,600,000 bbls. On the same date in 1939 they were 20,113,000 bbls. The industry had a little over 30,000,000 bbls. in stocks on Sept. 30, 1939, to start the last heating season. This was even less than the year before, when 30,800,000 bbls. were in stocks on Sept. 30, 1938. Oil companies last winter pulled 670,000 bbls. more from stocks than the year preceding.

As to how cold last winter was, weather bureau records now available show that average temperatures, on a degree-day basis for the first 5 months of this winter season, through January, were only about 2% colder than normal, yet were 13% colder than during the 1938-1939 winter. The



Trend in Heating Oil Supply and Demand

Despite the monthly fluctuations, the trend of production and shipments of gas oil and distillate fuels (of which 70% is heating oil) has been steadily upward for more than the three years shown. Stocks are those held at refineries at end of month. Figures from the U. S. Bureau of Mines monthly reports of refinery operations on which the chart is based, are given in the tables below

Domestic and Export Demand for Gas Oil and Distillate Fuel In U. S., by Months, 1937-39

(U. S. Bureau of Mines Reports)

	1937	1938	1939
	Thousands of Bbls.		
Jan.	16,950	14,899	17,345
Feb.	12,083	13,802	15,628
March	12,492	13,297	15,155
April	10,509	10,487	12,358
May	9,596	9,747	11,323
June	8,882	8,470	9,957
July	9,674	10,767	10,766
Aug.	10,243	10,470	11,545
Sept.	11,613	11,055	12,239
Oct.	12,504	11,663	14,084
Nov.	14,464	13,741	14,529
Dec.	17,849	18,069	18,238
Total	146,859	146,467	163,169

Refinery Stocks of Gas Oil and Distillate Fuels in U. S. By Months, 1937-39

(U. S. Bureau of Mines Reports)

	1937	1938	1939
	Thousands of Bbls.		
Jan.	19,088	21,543	24,650
Feb.	18,211	19,885	21,731
March	16,724	18,882	20,113
April	16,889	19,972	21,058
May	18,451	22,385	22,088
June	20,657	24,699	25,659
July	23,637	26,620	27,581
Aug.	25,952	28,841	29,282
Sept.	27,020	30,860	30,018
Oct.	28,101	33,017	30,951
Nov.	26,852	32,069	30,179
Dec.	22,566	27,873	26,374
Jan 31, 1940			21,057

Production of Gas Oil and Distillate Fuel in U. S., by Months, 1937-39

(U. S. Bureau of Mines Reports)

	1937	1938	1939
	Thousands of Bbls.		
Jan.	13,319	13,876	14,122
Feb.	11,206	12,144	12,709
March	11,005	12,294	13,539
April	10,674	11,577	13,301
May	11,158	12,160	12,353
June	11,088	10,784	13,530
July	12,654	12,688	12,688
Aug.	12,558	12,691	13,246
Sept.	12,681	13,074	12,975
Oct.	13,585	13,820	15,017
Nov.	13,215	12,793	13,757
Dec.	13,563	13,873	14,433
Total	146,706	151,774	161,670

two winters before that were less than normally cold also. The extreme cold during February and particularly March this year, may have increased the difference between this winter and a normal one.

Demand for heating oil last winter was the greatest in the history of the oil industry, there being more burners to fuel through one of the coldest of recent winters. In meeting this demand as it developed, refiners also produced large volumes of gasoline above the winter demand, which built up gasoline stocks to their high level of over 101,000,000 bbls. March 31.

Some oil company operating heads believe that, with gasoline stocks at these levels, more attempt should be made to adjust refining operations, so that a greater relative yield of gas oil and distillates can be secured from crude run to stills during the summer and this product stored in anticipation of the coming winter demand. This would avoid increasing gasoline stocks to such a great extent during the winter, when plants are meeting their peak demand for heating oils. Last June, refiners recovered 12.65% of gas oil and distillate fuels from crude, as against 13.43% recovery last December, it is pointed out.

"The industry should attempt to keep the yield of distillates higher this year than in previous spring and summer periods," said one refinery executive. "This would have the dual effect of building up adequate stocks for next winter and minimizing the effects of the surplus gasoline stocks which now prevail."

Other refiners say it is easier to talk about changing the ratio of gasoline to distillate yield than to actually bring it about in plant operations. The heavy investments in cracking plants, they say, make it necessary to produce as much gasoline as possible from them, if they are to be operated profitably.

The following analysis of the heating oil situation of the past winter, which contains much data valuable to marketers in planning against their needs of the next heating season, was presented by Fred Van Covern, New York, director of the department of statistics of the American Petroleum Institute, at the meeting of the Interstate Oil Compact Commission April 5, in Oklahoma City.

Current Heating Oil Situation Analyzed

By Fred Van Covern,
Director, Dept. of Statistics, American Petroleum Institute.

• • •

A CONDITION which had already been of considerable interest to the industry during recent years, but even so, without fulfilling all of the possibilities involved, seems during the past winter to have developed its full potentialities. I am referring to the rapid growth in the number of home-heating oil burners in use and the fuel which they consume and the number of automotive vehicles and the growth in their consumption of gasoline, in relation to the yield of these two products from a barrel of crude oil, and the industry's operating practices with respect thereto.

Time was when this was a kerosine industry and gasoline a nuisance product. With the advent of the internal-combustion engine gasoline became the principal product, but more recently furnace oils seem to have pressed for greater recognition. Obviously the industry has not followed any co-ordinated policy with respect to these changing trends, and while it may not be correct to say that operators did not realize the full potentialities involved, it does seem as though not enough consideration has been given to the possible effects of the actual progress of events.

There are still many important elements in the industry who seem to think of it as one in which gasoline, or motor fuel, is the principal product, probably because they do not have furnace oils for sale. Others seem to have followed the policy of disposing of only that which is incidental to the production of gasoline, while the more general practice seems to have been to establish furnace oil as a principal product, along with gasoline, until the home-heating oil market has grown to such an extent that it now demands an important segment of each barrel of crude processed.

That the burning of petroleum oils in home-heating units is proper economic use of such oils can hardly be denied. Their use seems, however, to have outgrown, or at least to have increased faster than the ability to build into refineries the necessary flexibility as between the required production of gasoline and these light fuels; or, is their rapid growth and the present situation the logical outcome of the industry's operating practices of the past in conjunction with the relationship which has existed between the price of the two as finished products, and the economic worth of cracking stock. Regardless of how it was brought about, the industry has, nevertheless, with it today the very important problem of how more nearly to balance their combined supply and demand. And, it can hardly be denied that as any given portion of the barrel of crude oil moves towards principal product distinction, that trend carries with it the responsibility of assuming, for that particular fraction, a corresponding liability in relation to the cost of the raw material required.

Perhaps the flexibility necessary does exist within the limits of present facilities and I will come to that again later. Is it merely a question of shifting yields, or is it more complicated than that? Does the question of octane rating of gasoline enter? Should calculations of crude oil requirements be placed upon a combination yield basis? It may be that the situation merely requires a change in method of operation, and the building up during the summer months of larger inventories of these fuels before the winter period sets in. Up to the present time the industry seems to have chosen to make furnace oils as the requirements of the season dictated rather than build up inventories in anticipation of future sales.

From the figures contained in Table II one may note how the growth in the demand for motor fuel and furnace oils has progressed in relation to each other and in relation to the yields of these products from a barrel of crude oil.

It is readily apparent from a study of the figures that the number of home-

TABLE II—Motor Fuel and Gas Oil & Distillate Fuel Demand, Number of Burners and Yields

Year	Motor Fuel Demand (Bbls.)	Gas Oil & Distillate Fuel Demand (Bbls.)	Number of Burners In Use (End of Year)	Yield from Crude Oil Motor Fuel %	Yield from Crude Oil Gas & Dis. Fuels %
1933	409,815,000	76,172,000	913,000	43.69	9.16
1934	435,025,000	89,330,000	1,014,000	43.41	10.60
1935	465,423,000	102,277,000	1,155,000	44.19	10.38
1936	510,252,000	123,205,000	1,356,000	44.08	11.78
1937	557,658,000	146,970,000	1,544,000	43.92	12.40
1938	573,112,000	147,090,000	1,658,000	44.30	13.03
1939	597,116,000	163,956,000	1,905,000	44.89	13.06
Increase	45.7%	115.2%	108.7%	.....	.....

TABLE III—Light Fuel Inventories, Number of Burners and Motor Fuel Comparisons

Year	Sept. 30, Gas Oil & Distillate Fuel Inventories (Bbls.)	Number of Home-Heating Oil Burners in Use End of Year	Per Cent Increase	Finished & Unfinished Gasoline Economic Requirements March 31, following year (Bbls.)	Actual Inventories (Bbls.)
1935	24,272,000	1,155,000	13.9	70,000,000	74,485,000
1936	27,871,000	1,356,000	17.4	73,500,000	81,651,000
1937	27,020,000	1,544,000	13.9	75,000,000	92,277,000
1938	30,860,000	1,658,000	7.4	78,500,000	87,121,000
1939	30,018,000	1,905,000	14.9	82,000,000	*101,000,000
4-Year increase	64.9%	*March 30, 1940 estimated.			

TABLE IV—Percentage Yield of Products from Crude Oil

Year	Gas Oil & Distillate Fuels—Quarters Ended: June	Sept.	Dec.	Following March	Gasoline (Straight-Run & Cracked)—Quarters Ended: June	Sept.	Dec.	Following March
1935	9.95	10.18	10.88	12.64	44.04	44.80	44.37	42.73
1936	11.09	11.24	12.20	12.99	44.36	44.62	44.50	44.21
1937	11.22	12.09	13.32	13.59	44.00	43.35	44.16	43.25
1938	11.95	12.90	13.67	14.10	44.05	45.06	44.76	44.74
1939	12.65	12.16	13.43	.....	44.56	44.87	45.34	.....

heating oil burners in use has grown tremendously over the last several years, to such an extent, in fact, that while gasoline increased about 45% during the six-year period from 1933 to 1939, gas oil and distillate fuel oil demand, of which furnace oils comprise the largest single item, increased more than twice that much, or about 115%.

Further light is thrown on this situation when a study is made of the inventories of these light fuels at the beginning of the past several winters. In spite of an increase of over 17% in the number of burners at the end of 1936, compared with 1935, the industry entered the 1936-1937 winter season with only about 3,500,000 bbls. greater light fuel inventories; in the face of an additional 14% increase in burners in 1937, stocks of these oils were less entering the 1937-1938 winter than in the previous year. The situation was not as bad in relation at the beginning of the 1938-1939 winter but at the opening of the past heating season stocks of furnace oils actually were less in comparison with those of a year before even in face of another increase in the number of burners of close to 15 per cent.

In other words, the figures indicate that on Sept. 30, 1939, inventories entering the winter season were only 24% higher than on Sept. 30, 1935, in spite of an increase in the number of burners to be supplied of about 65%, and these figures become particularly significant when one realizes the relationship between a home-heating burner and the average automotive unit. My estimates show that the average burner will consume approximately 2,300 gals. in a heating season (September to May) while the average automotive unit consumes only about 730 gals. of gasoline a year. (1939 calculated average). If there is any doubt as to what such conditions mean with respect to gasoline inventories, the figures in the last two columns of Table III are very enlightening.

OF course, it is impossible to forecast the weather and winter temperatures and that is where one of the greatest difficulties lies. The records that are presently available show that the average temperatures on a degree-day basis for the first five months of this winter season were about 2% colder than normally might have been expected, yet 13% colder than during the 1938-1939 winter, which heating season continued a trend that began two years earlier in that the three winters prior to the present one were less than normally cold when measured on a degree-day basis.

Statistics on burner sales are readily available and the number of burners that probably will be in use during a given winter is susceptible of fairly easy calculation, but temperatures can only be related to expected normals. It does seem, however, that greater inventories of these oils in relation to the number of burners in use and normal winters are indicated at the opening of coming winter seasons than have been carried in the past. About 60-62% of the demand for gas and distillate fuel oils comes during the six-months period from October to March, yet the greatest buildup of inventories of these products during the past five summer seasons was about 12,000,000 bbls. in 1936, while the average of the five has been about 10,000,000.

Not only has the industry as a whole chosen to more or less produce these amounts as required but also seemingly, at least, has it elected to retain a fairly uniform gasoline yield, producing approximately 3½ barrels of gasoline to every barrel of light fuels produced. This did not hold

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TABLE V—Percentages of U. S. Domestic Demand for Gas Oil and Distillate Fuel Oil and Domestic Heating Oil by Geographical Sub-Divisions

(Compiled from reports of the Bureau of Mines)

	Gas Oil and Distillate Fuel Oil Percentage of U.S.			Domestic Heating Oil Percentage of U.S.		
Sub-divisions:	**1936**	**1937**	**1938**	**1936**	**1937**	**1938**
New England	13.8	14.9	14.9	18.5	18.7	18.5
Middle-Atlantic	33.6	33.5	34.1	40.4	39.8	39.6
Sub-total	47.4	48.4	49.0	58.9	58.5	58.1
North Central	21.5	24.0	24.8	28.7	28.5	28.7
Sub-total	68.9	72.4	73.8	87.6	87.0	86.8
Other States East of Pacific Coast	16.6	11.4	12.3	9.3	9.3	8.8
TOTAL EAST OF CALIFORNIA	85.5	83.8	86.1	96.9	96.3	95.6
Pacific Coast	14.5	16.2	13.9	3.1	3.7	4.4
TOTAL UNITED STATES	100.0	100.0	100.0	100.0	100.0	100.0

during the 1935-1936 winter but seems to have been the practice during more recent years. Table IV shows a comparison of the yields for the entire country by quarters during the past five years. It will be noted that distillate yields have always increased during the winter season but gasoline yields have not as a general rule shown corresponding declines, at least not for the industry as a whole.

Up until now we have been talking about this from more or less of a nationwide point of view, but it can be narrowed still further. The latest information available shows that about 58% of all the home-heating oils used in the U. S. are consumed in the New England and Middle-Atlantic states. An additional 29% are used in the North Central states. In all other areas East of California another 9% is consumed, and on the Pacific Coast about 4.5%.

IT is interesting to take another look at the gasoline inventories by refining districts in the light of the statements just made. The areas that supply the greater portions of the heating oils are the areas in which gasoline inventories show the greatest increases, and the only areas in which there is a rather well-defined tendency towards a shifting in yields as between gasoline and light fuel, particularly during the winter season. This has not been as definitely discernible during the summer months, however.

Oklahoma-Kansas, Inland Texas and other districts do not supply any very great portion of the heating-oil market, but neither have they increased their gasoline stocks as much as the others.

California's problem has not been one in which large quantities of heating oils have had to be supplied though it is a fact that the consumption of furnace oils on the Pacific Coast has experienced a relatively large increase during the last few years.

The following summary on the heating oil situation was presented by Mr. Van Covern at the close of his remarks before the Interstate Oil Compact Commission, which also included a discussion of crude oil, export markets and other factors in the current oil situation:

That if improved conditions are to prevail at the end of the 1940-41 winter, lower motor fuel stocks are indicated at the end of the coming summer, when compared with last year, and higher light fuel oil inventories.

That increased yields of light fuels are not only necessary but possible and entirely within the limits of flexibility of present facilities.

That it is not immediately apparent that the shifting of gasoline and light oil fuel yields will affect octane requirements.

That this may not be the situation with respect to all refiners, but it would appear that in those districts in which this is an important problem, reforming equipment and the other facilities necessary are generally available.

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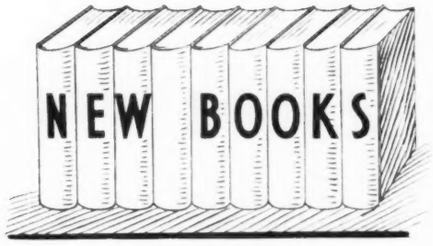

Lack of Oil, Hitler's Achilles Heel Says Geologist, in New Book for Layman

Unless Germany drills into a high-powered oil field at home, and follows with rapid construction of refinery facilities, Hitler stands as much chance of winning the present European war as an oil well does of producing a million barrels a day.

This is a conclusion of Oil Expert Max W. Ball, in his book, published this month, titled "This Fascinating Oil Business".

No quick-change press association reporter, who assumes the role of Oil Editor for the duration of the war, Mr. Ball has been associated with the oil industry for 30 years, holding highly technical positions. At present he is a consulting engineer and geologist, dividing his time between Denver and Edmonton, Alberta, Can.

But it should not be assumed that his book is particularly concerned with the European war, as the greater number of its 444 pages is devoted to a comprehensive history of the oil industry, both in the U. S. and abroad.

In discussing the possible sources for Germany's war-time oil imports, Author Ball makes no generalities. Rather, he takes the ultra-conservative figure of 90,000,000 barrels, estimated by V. R. Garfias, one of America's leading oil statisticians, as being Germany's war-time oil consumption, and with this in mind, probes all possible sources from which Germany could get oil.

Concerning the possibilities of obtaining control of Rumania's oil fields, this book states: "In the World War, Germany captured the Rumanian fields —and found them so thoroughly wrecked that they were worthless for the duration." According to Author Ball, these fields will be wrecked again —if Germany tries to capture these fields for the second time.

While "This Fascinating Oil Business" is written in a story-like manner, no essential facts concerning the oil industry are omitted. Even before a drilling site is chosen, until the ultimate consumption of gasoline and other petroleum products, the reader is carried along with a "what next" attitude. And Mr. Ball is not one to disappoint such readers.

This book is well illustrated with maps showing locations of the world's oil fields, drawings of oil wells, drilling tools, rock formations, rotary drilling equipment, tanks, loading racks, pipelines, bubble towers, modern refineries, and gasoline pumps.

After acquainting his readers with the oil men and their tools, the author takes them for a quick tour around the oil fields, uses as much of the drillers' colorful language as the printed page allows, mirrors the human tears that gush with dry wells, and pushes on into transportation—after the excitement that accompanies "drilling in" has subsided.

Watching pipelines being laid, the reader is absorbed with the herculean task of laying pipes over mountains and deserts, across and under rivers, and through swamps.

Upon arriving at the refinery, the reader is told the chemistry of refining, refining specifications and designs, and of the physical aspects of the refinery itself. He learns about distillation, topping or skimming, catalytic cracking, polymerization, and hydrogenation processes.

In the section discussing the marketing of petroleum products, Oil Expert Ball states: "There is no oil exchange or board of trade at which bid and asked prices are recorded, but spot-market quotations are published daily in a sheet called Platt's Oilgram, and Platt's Oilgram prices are generally accepted as gospel. Most contracts for future deliveries are based on them."

The production and peculiarities of each oil-producing state in this country is reviewed. For instance, the oil history of Texas, the largest producing state, is told from the time that only 45 to 65 barrels were produced yearly —"about enough to oil the guns of the Texas Rangers"—until 1938's production of 475,614,000 barrels—24% of the world's output. The oil situation in all foreign countries is related.

The appendix contains charts showing the organization of a typical oil company, geological timetables, oil lease forms, and late production figures

for every state and country in the world.

While it is obvious that the less experience a person has had in the oil business, the more he can learn from reading this book, its pages contain much information for every man in the petroleum industry—including those whose length of service has taught them to smell a drop of oil at 20 paces.

For your convenience, NPN will supply you "This Fascinating Oil Business", which sells for $2.50 a copy. Simply send your check or money order for the number of copies you want, to NATIONAL PETROLEUM NEWS, Penton Building, Cleveland.

NPN Bows to Poet Riley And Indiana Oil Men

In N.P.N.'s article from the Two-Gallon Buyer, in the April 10th issue, it was stated that the home of James Whitcomb Riley, the famed Hoosier poet, was in Greenfield, Ill., instead of Indiana. Staunch Indiana oil marketers immediately arose to protest this as an insult both to Poet Riley and to their state.

While he does not have as many years back of him as some of these veteran Indiana oil men, and though he comes from a distant part of the country, the Two-Gallon Buyer wagers he can recite as many verses of the "Ole Swimming Hole" as some of them can. He has always been an admirer of the Hoosier poet and it was only that he was at the time more interested in how gasoline was sold along the highway than in geography, that made him put Greenfield in Illinois instead of Indiana.

No Squeaks in 1000 Miles Guaranteed on Lube Jobs

Guaranteed: 1000 squeak-free miles, within 30 days.

This is the A to Z lubrication offer being made at Sun Oil Co. stations.

A guarantee is given the motorist who buys a lubrication job, which reads: "The undersigned guarantees all parts lubricated with A to Z lubrication will be free from squeaks for 1000 miles. A re-lubrication of any part, free of charge, if a squeak develops before 1000 miles." It is stated the offer does not include front wheel bearings and covered springs, which are extra charge services. The form has a space for the owner or operator of the station to imprint his name, also space for the motorist's name, car license number and mileage when the lubrication work was done.

Two mailing cards for dealers are part of the squeak-free lubrication offer. One announces the service and invites the motorist to try it. The second is sent those who have already participated in the service and states: "Your car was guaranteed not to squeak for 1000 miles. If your car registers more than ..... miles, it is ready for another guaranteed, no-squeak lubrication."

TRADEMARKS

The following are trademark applications pertinent to our field pending in the United States Patent Office which have been passed for publication and are in line for early registration unless opposition is filed promptly. For further information address National Trade-Mark Company, Munsey Building, Washington, D. C., trademark specialists.

TREK, Ser. No. 427,438. National Carbon Co., Inc., New York City. Filed Jan. 13, 1940. For anti-freeze. Published March 19, 1940.

HANDIGAS, Ser. No. 427,714. Liquified Gas Co., Lima, Ohio. Filed Jan. 22, 1940. For manufactured gas. Published March 19, 1940.

KEY, and picture of a key, Ser. No. 428,161. Key Manufacturing Co., Fall River, Mass. Filed Feb. 2, 1940. For oil filters and oil filter cartridges. Published March 19, 1940.

BETAFORM, Ser. No. 427,368. The C. B. Dolge Co., Westport, Conn. Filed Jan. 12, 1940. For insecticides. Published March 19, 1940.

PESTROL, Ser. No. 426,178. Antrol Laboratories, Inc., Los Angeles. Filed Dec. 4, 1939. For liquid insecticides. Published March 19, 1940.

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LIQUID SEAL TANK VENT
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Markets

Mid-Continent

TULSA, April 13.—Adoption of the A.S.T.M. method of octane test and octane brackets recommended recently by the Western Petroleum Refiners Ass'n. was general in the Mid-Continent, according to reports the past week. At the end of the week, only two refiners in North Texas, and one in Arkansas were still reporting prices on the basis of L-3 octane test. All refiners in Oklahoma, East and West Texas, and Louisiana, reporting open spot prices, said they were on the new basis.

Gasoline quotations reported by 13 Oklahoma refiners at the end of the week ranged from 4.75c to 5.25c for 72-74 octane, 4.25c to 4.75c for 63-66 octane, and 4c to 4.25c for 60 octane and below, all A.S.T.M. octane. Quotations reported by Oklahoma refiners at the beginning of the week had ranged from 4.50 to 4.6875c for 70-72 octane, 4.25c to 4.4375c for 67-69 octane, 4c to 4.4375c for 63-66 octane, and 3.75c to 3.9375c for 62 octane and below, all L-3 octane.

No changes were reported in quotations for other products. A total of 19 cars of Grade 26-70 natural gasoline were reported sold on an F.O.B. Group 3 basis, 14 cars at 1.50c and 5 cars at 1.75c. Group 3 quotations ranged up to 2c, with F.O.B. Breckenridge quotations at 1.25c, according to reports. Two sellers reported selling a total of 5 cars of Grade 26-70 at 2c, F.O.B. their plants, for "local" and Kansas delivery.

Mid-Western

CHICAGO, April 13.—Five refiners in Chicago reported the past week they had adopted the new gasoline brackets and the A.S.T.M. octane test method recommended recently by the Western Petroleum Refiners Assn. Two other refiners announced that they would change to the new brackets April 15, and a third said he would make some change April 15.

Demand for gasoline was good with demand for tractor fuel and kerosine improving, according to reports.

Group 3 gasoline quotations (A.S.T.M. octane) reported by five refiners at the end of the week ranged from 4.75c to 5.25c for 72-74 oct., 4.50c to 4.75c for 63-66, and 3.875c to 4.25c for 60 oct. and below. Two refiners reported quoting 4.50c for 70-72 oct. (L-3) and one refiner said he was quoting 4.25c for 67-69 (L-3) and 3.75c for 62 oct. and below (L-3), FOB group 3.

A.S.T.M. Group 3 quotations reported by marketers were: one at 4.25c, two 4.375c, and two 4.50c for 72-74 oct.; two at 4, and one 4.125c for 63-66; one at 3.50c, and two at 3.75c for 60 oct. and below. L-3 Group 3 quotations reported by marketers were: two at 4.25c, and one 4.50c for 70-72 oct.; one 3.875c, and one 4c for 67-69; one 3.875c for 63-66; one 3.375c and one 3.50c for 62 oct. and below.

Three marketers reported following open spot sales: 14 cars 70-72 oct. (L-3) leaded, 10 at 4c, 2 at 4.125c, and 2 at 4.25c; 3 cars 63-66 oct. (L-3) at 3.625c; 3 cars 62 oct. and below (L-3) at 3.375c.

Sales of two cars of range oil at 3.625c and 1 car of No. 3 fuel at 3.375c, FOB Group 3 also were reported by marketers. Refiners' Group 3 quotations for range oil ranged from 3.75c to 4c, and for No. 3 fuel 3.25c to 3.375c. Marketers quoted 3.625c to 3.75c for range oil, and 3.125c to 3.375c for No. 3 fuel.

Atlantic Coast

NEW YORK, April 13.—Light fuel oils were offered at lower prices at some Atlantic Coast points while gasoline and kerosine quotations for the most part were unchanged, according to reports of suppliers the past week.

A Baltimore supplier reported reducing his quotation for No. 2 fuel 0.5c to 5c. Quotations for No. 2 reported by other Baltimore suppliers ranged up to 5.50c. At Philadelphia, one supplier announced a 0.5c cut to 4.75c in his quotation for No. 4 oil; quotations reported by other suppliers ranged up to 5.35c.

A barge-lot sale of 72-74 oct. gasoline at 6c was reported by a New York harbor supplier. Other suppliers' quotations ranged up to 7.20c a gal. No other open spot sales were reported. At Boston, a barge terminal operator said he was offering 68-70 oct. gasoline at 6c. Quotations for 68-70 reported by Boston refiners and tanker terminal operators were at 6.75c.

N.P.N. Gasoline Index

	Dealer T.w. Cents per	Tank Car Gal.
April 15	9.52	5.88
Month ago	9.61	5.86
Year ago	9.37	5.53

Dealer index is an average of "undivided" dealer prices, ex-tax, in 50 cities.

Tank car index is a weighted average of 9 wholesale markets for regular-grade gasoline.

Pennsylvania

CLEVELAND, April 13.—Conflicting reports regarding the status of lubricating oils were received from western Pennsylvania refiners the past week. Prices for the key grades, however, were reported unchanged. Kerosine was offered lower in the upper field. Wax regained 0.1c of the ground lost in the recent sharp downswing of prices.

Domestic movement of lubes has picked up considerably, according to reports of some refiners. Others said they had not noticed any improvement, one adding that he was "running into all kinds of competition." He said he was quoting 25c for 25 pour 200 vis. neutral, and 23c for 25 pour 150 vis. neutral and bright stock. "But I'm meeting competition below those prices," he added.

One refiner said he looked for an early revival of export lube buying in the light of recent European events. Apparently a revival in export wax buying had already set in, for such buying was said to have occasioned a 0.1c advance to 4.75c, New York, in the low of prices reported by refiners for white crude scale.

Kerosine, 45 w.w., was offered 0.125c lower at 5c in tank cars by an upper field refiner who also said he was getting 5.25c for truck lots. Quotations of other upper field refiners were reported at 5.125c.

California

LOS ANGELES, April 13.—Quotations for all California off-shore shipments of petroleum products were reported unchanged the past week but suppliers generally said they anticipated early advances in export prices as a result of current European war developments.

Little direct benefit for West Coast business was seen in the form of increases in cargo shipments from California ports to Atlantic foreign ports, because the present handicap of high charter and insurance rates for tankers crossing the Atlantic was expected to increase rather than diminish through the possible withdrawal of Norwegian vessels from that service. Higher prices for oil products in eastern states and in world markets were, however, expected to be reflected in corresponding advances here.

Increased demand was said to be

(Continued on page 52)

REFINERY and SEABOARD PRICES

In bulk lots by Motor Transport, Tank Car, Barge or Tanker as shown

HOW PRICES ARE REPORTED—

Refinery and Seaboard prices in National Petroleum News are gathered by PLATT'S OILGRAM and are as published in the Monday issue of the OILGRAM.

PLATT'S OILGRAM is a reporting service issued in three identical editions daily from News Bureaus at New York, Cleveland, and Tulsa, Okla. PLATT'S OILGRAM gathers and publishes what its publisher and representatives believe to be accurate news of sales, prices and current happenings affecting the oil industry and that will be of interest to its subscribers. As this information is usually private, OILGRAM reports it according to what it is able to obtain from sources deemed reliable.

All information is supplied without guarantee as to its completeness, accuracy, time of transmission or promptness of delivery.

The subscriber receives this information for his private use and not for resale or further distribution.

Publisher reserves the right to change the extent, nature and form of showing this information at any time.

Prices shown in the tables are quotations (meaning sellers' general offers or posted prices), or actual sales prices, reported to OILGRAM by refiners for "open spot" transactions, except as otherwise specified.

Prices arrived at by discounts off a specified price or "market date of shipment," prices named in contracts or prices arrived at in accordance with any arrangement made prior to date of sale, are not for "open spot" transactions and therefore are not considered in making the price tables. Prices made to brokers and prices in "inter-refinery" transactions are also not considered except as may be noted.

All prices are for "immediate" shipment except in Gulf Coast bulk transactions where shipment is generally to be made in ninety days. Prices are FOB refineries, pipelines, or tanker terminals in districts designated.

Prices shown are for quantities in bulk such as tank car lots, motor transport lots or barge lots; and in cents per gallon; heavy fuel oils are in dollars per barrel of 42 U.S. gallons; wax and petrolatums are in cents per pound. Prices applying to barges or cargoes only are so designated.

Prices do not include taxes or inspection fees. Prices are published at the close of the business day.

Mid-Western prices in the tables were gathered from refiners with offices located in Chicago and the surrounding territory. While the prices are quoted on a Group 3 (Oklahoma) freight basis, this is in accordance with the custom of the oil industry which uses Group 3 as a price basis for the ease of comparing prices even when the material originates in another refining district. Other refinery prices are given by and for the particular refining district where the material is made and from which it is shipped.

When prices obtained by OILGRAM do not conform to these conditions the exception and the new conditions are noted in the news lead or in conjunction with the price table by footnote or otherwise, for the particular refinery or sales district involved.

Crude oil and products covered by OILGRAM'S news and price service, except where noted, have been represented to the publisher as fully up to the customary trade specifications indicated and according to the generally accepted methods of test; and all crude oil and all products thereof as having been lawfully produced and transported.

Any apparent error should be reported to the nearest OILGRAM or National Petroleum News office at once as no correction will be made after the second issue of the OILGRAM or National Petroleum News following its publication.

Summary of Daily Gasoline Prices (April 8 to April 15)

	Latest Prices Mon. April 15	April 8	April 9	April 10	April 11	April 12
U. S. Motor, (Oct. L-3)						
70-72 octane:						
Oklahoma	(e)	4.50 –4.6875	4.50 –4.6875	(b) 4.50–4.6875	(e)	(e)
Mid-Western (Group 3 basis)	(a)4.50	4.50 – 4.75	4.50 – 4.75	(o) 4.50 –4.75	(n) 4.50 –4.75	(b)4.50
N. Tex. (For shpt. to Tex. & N. M. dest'ns.)	(e)	4.625– 4.75	4.625– 4.75	(m) 4.625–4.75	(m)4.625– 4.75	(b)4.75
W. Tex. (For shpt. to Tex. & N. M. dest'ns.)	(e)	(e)	(e)	(e)	(e)	(e)
East Texas	(e)	(e)	(e)	(e)	(e)	(e)
67-69 octane:						
Oklahoma	(e)	4.25 –4.4375	4.25 –4.4375	(b) 4.25–4.4375	(e)	(e)
Mid-Western (Group 3 basis)	(e)	4.25 –4.4375	4.25 –4.4375	(n) 4.25–4.4375	(m)4.25	(a)4.25
N. Tex. (For shpt. to Tex. & N. M. dest'ns.)	(e)	(a)4.375	(a)4.375	(a)4.375	(a)4.375	(e)
W. Tex. (For shpt. to Tex. & N. M. dest'ns.)	(e)	(e)	(e)	(e)	(e)	(e)
63-66 octane:						
Oklahoma	(e)	(b) 4.00–4.4375	(b) 4.00–4.4375	(a)4.4375	(e)	(e)
Mid-Western (Group 3 basis)	(e)	(b)4.00	(b)4.00	(a)4.00	(a)4.00	(e)
N. Tex. (For shpt. to Tex. & N. M. dest'ns.)	(e)	(a)4.125	(a)4.125	(a)4.125	(a)4.125	(e)
W. Tex. (For shpt. to Tex. & N. M. dest'ns.)	(e)	(e)	(e)	(e)	(e)	(e)
62 octane and below:						
Oklahoma	(e)	3.75 –3.9375	3.75 –3.9375	(b) 3.75–3.9375	(e)	(e)
Mid-Western (Group 3 basis)	(e)	3.75 – 4.125	3.75 – 4.125	(n) 3.75 –4.125	(m)3.75 –4.125	(a)3.75
N. Tex. (For shpt. to Tex. & N. M. dest'ns.)	(e)	3.875– 4.00	3.875– 4.00	(m) 3.875–4.00	(m) 3.875–4.00	(b)4.00
W. Tex. (For shpt. to Tex. & N. M. dest'ns.)	(e)	(e)	(e)	(e)	(e)	(e)
U. S. Motor, (ASTM octane)						
72-74 octane:						
Oklahoma	(x) 4.75 –5.25	4.75 – 5.25	4.75 – 5.25	(v) 4.75 –5.25	(x) 4.75 –5.25	(x) 4.75 –5.25
Mid-Western (Group 3 basis)	(s) 4.75 –5.25	(b)5.25	(b)5.25	(m) 4.75 –5.25	(o) 4.75 –5.25	(o) 4.75 –5.25
N. Tex. (For shpt. to Tex. & N. M. dest'ns.)	(p) 4.75 –4.875	(a)4.875	(a)4.875	(a)4.875	(a)4.875	(b) 4.75 –4.875
W. Tex. (For shpt. to Tex. & N. M. dest'ns.)	(b)5.00	(b)5.00	(b)5.00	(b)5.00	(b)5.00	(b)5.00
East Texas	(a)5.00	(a)5.00	(a)5.00	(a)5.00	(a)5.00	(a)5.00
63-66 octane:						
Oklahoma	(w) 4.25 –4.75	4.375– 4.75	4.25 – 4.75	(u) 4.25 –4.75	(w) 4.25 –4.75	(w) 4.25 –4.75
Mid-Western (Group 3 basis)	(s)4.375–4.75	(b)4.75	(b)4.75	(m) 4.375–4.75	(o) 4.50 –4.75	(o) 4.375–4.75
N. Tex. (For shpt. to Tex. & N. M. dest'ns.)	(o) 4.50 –4.625	(a)4.625	(a)4.625	(a)4.625	(a)4.625	(b) 4.25 –4.625
W. Tex. (For shpt. to Tex. & N. M. dest'ns.)	(b)4.625	(b)4.625	(b)4.625	(b)4.625	(b)4.625	(b)4.625
60 octane & below:						
Oklahoma	(w) 4.00 –4.25	4.00 – 4.25	4.00 – 4.25	(u) 4.00 –4.25	(w) 4.00 –4.25	(w) 4.00 –4.25
Mid-Western (Group 3 basis)	(s) 3.875–4.25	(b) 4.125–4.25	(b) 4.125–4.25	(m) 4.00–4.25	(o) 3.875–4.25	(o) 3.875–4.25"
N. Tex. (For shpt. to Tex. & N. M. dest'ns.)	(p) 4.00 –4.125	(a)3.875	(a)3.875	(a)3.875	(a)3.875	(b) 3.875–4.00
W. Tex. (For shpt. to Tex. & N. M. dest'ns.)	(b)4.00	(b)4.00	(b)4.00	(b)4.00	(b)4.00	(b)4.00
Motor Gasoline, 72-74 octane (ASTM):						
New York harbor	6.25 – 7.20	6.25 – 7.20	6.25 – 7.20	6.25 – 7.20	6.25 – 7.20	6.25 – 7.20
Philadelphia district	6.25 – 7.75	6.25 – 7.75	6.25 – 7.75	6.25 – 7.75	6.25 – 7.75	6.25 – 7.75
Baltimore district	6.25 – 7.75	6.25 – 7.75	6.25 – 7.75	6.25 – 7.75	6.25 – 7.75	6.25 – 7.75
Motor Gasoline:						
"Q" Gasoline:						
Bradford-Warren (Western Penna.)	(b)5.75	(b)5.75	(b)5.75	(b)5.75	(b)5.75	(b)5.75
Other Districts (Western Penna.)	5.50 – 5.625	5.50 – 5.75	5.50 – 5.75	5.50 – 5.75	5.50 – 5.75	5.50 – 5.625
75-76 Octane: (L-3)						
Bradford-Warren (Western Penna.)	(b) 6.00	(b) 6.00 –6.25	(b) 6.00 –6.25	(b) 6.00 –6.25	(b)6.00	(b)6.00
Other Districts (Western Penna.)	(a)6.25	(a)6.25	(a)6.25	(a)6.25	(a)6.25	(a)6.25

REFINERY PRICES

Gasoline

U. S. Motor (Oct. L-3) except where otherwise specifed

Prices Effective	April 15	April 8
OKLAHOMA		
70-72 oct.	(e)	4.50 –4.6875
67-69 oct.	(e)	4.25 –4.4375
63-66 oct.	(e)	(b)4.00 –4.4375
62 oct. & below	(e)	3.75 –3.9375
60-62 400 e.p.	(b)4.00	(b)4.00
U.S. Motor Gasoline (ASTM Octane)		
72-74 oct.	(x) 4.75 –5.25	4.75 – 5.25
63-66 oct.	(w) 4.25 –4.75	4.375– 4.75
60 oct. & below	(w) 4.00 –4.25	4.00 – 4.25
MID-WESTERN		
70-72 oct.	(a)4.50	4.50 – 4.75
67-69 oct.	(e)	4.25 –4.4375
63-66 oct.	(e)	(b)4.00
62 oct. & below	(e)	3.75 – 4.125
U.S. Motor Gasoline (ASTM Octane)		
72-74 oct.	(s) 4.75 –5.25	(b)5.25
63-66 oct.	(s) 4.375–4.75	(b)4.75
60 oct. & below	(s) 3.875–4.25	(b)4.125–4.25

Prices Effective	April 15	April 8
N. TEX. (For shpt. to Tex. & N. M. dest'ns.)		
70-72 oct.	(e)	4.625– 4.75
67-69 oct.	(e)	(a)4.375
63-66 oct.	(e)	(a)4.125
62 oct. & below	(e)	3.875– 4.00
U.S. Motor Gasoline (ASTM Octane)		
72-74 oct.	(p) 4.75 –4.875	(a)4.875
63-66 oct.	(o) 4.50 –4.625	(a)4.625
60 oct. & below	(p) 4.00 –4.125	(a)3.875
60-62, 400 e.p.	(b)4.00	(a)4.00
W. TEX. (For shpt. to Tex. & N. M. dest'ns.)		
U.S. Motor Gasoline (ASTM Octane)		
72-74 oct.	(b)5.00	(b)5.00
63-66 oct.	(b)4.625	(b)4.625
60 oct. & below	(b)4.00	(b)4.00
CENT. W. TEX. (Prices to truck transports)		
63-66 octane	(e)	(a)4.625
62 oct. & below	(e)	(a)4.00

Prices Effective	April 15	April 8
E. TEX.		
U.S. Motor Gasoline (ASTM Octane)		
72-74 oct.	(a)5.00	(a)5.00
60-62, 400 e.p.	(a)4.25	(a&z)4.25
KANSAS (For Kansas destinations only)		
70-72 oct.	(e)	(a)5.125
67-69 oct.	(e)	(a)4.625
62 oct. & below	(e)	(a)4.375
U.S. Motor Gasoline (ASTM Octane)		
72-74 oct.	(o) 5.00 –5.125	5.00
63-66 oct.	(o) 4.50 –4.875	4.625– 4.75
60 oct. & below	(o) 4.125–4.375	4.25
N. LA. (For shipment to La. & Ark.)		
U.S. Motor Gasoline (ASTM Octane)		
72-74 oct.	(a) 5.125–5.375	(a) 5.125–5.375
63-66 oct.	(a) 4.625–4.875	(a) 4.625–4.875
60 oct. & below	(a) 4.25 –4.50	(a) 4.25 –4.50

(a) One refiner quoting. (b) Two refiners quoting. (e) No quotations reported. (f) Prices FOB Central Michigan refinery group basis for shipment within Michigan; shipments may originate at plants outside Central group. (g) Excluding Detroit shipment. (h) For shipment to Ark. points only. (i) Quotations. (j) Sale. (k) Sales. (m) Three refiners quoting. (n) Four refiners quoting. (o) Five refiners quoting. (p) Six refiners quoting. (r) Seven refiners quoting. (s) Eight refiners quoting. (t) Nine refiners quoting. (u) Ten refiners quoting. (v) Eleven refiners quoting. (w) Twelve refiners quoting. (x) Thirteen refiners quoting. (y) Fourteen refiners quoting. (z) This price correct for Apr. 8.

REFINERY PRICES (Continued)

Gasoline (Cont'd)

Prices Effective	April 15	April 8
ARK. (FOB Ark. plant of one refiner, for shipment to Ark. & La.)		
70-72 oct.	4.75	4.75
67-69 oct.	4.50	4.50
62 oct. & below	4.00	4.00
WESTERN PENNA. (Motor gasoline.)		
Bradford-Warren:		
75-76 oct. (L-3)	(b)6.00	(b)6.00–6.25
"Q" gasoline	(b)5.75	(b)5.75
U.S. Motor (58-62°)	(b)4.50–5.00	(b)4.50–5.00
Other districts:		
75-76 oct. (L-3)	(a)6.25	(a)6.25
"Q" gasoline	5.50–5.625	5.50–5.75
U.S. Motor (58-62°)	(a)4.50	(a)4.50
CENTRAL MICHIGAN (f)		
U.S. Motor: (Oct. L-3)		
72-74 oct.	6.50–7.00	5.50–6.25
67-69 oct.	5.50–6.25	6.50–7.00
Str.-Run Gasoline	(g)4.25–4.50	(g)4.25–4.50
OHIO (S. O. Ohio quotations for statewide delivery and subject to exceptions for local price disturbances)		
70-72 oct. (ASTM)	7.00	7.00
CALIFORNIA U.S. Motor:		
58-61 grav., 375-400 e.p., 65 oct. & above	7.25–9.75	7.25–9.75
54-58 grav., for outside state shipment	6.25–9.00	6.25–9.00
54-58 grav., for instate shipment	6.00–9.25	6.00–9.25

Kerosine, Gas & Fuel Oils

Prices Effective	April 15	April 8
OKLAHOMA		
41-43 grav. w.w.	3.875–4.25	3.875–4.25
42-44 grav., w.w.	4.00–4.625	4.00–4.625
Range Oil	3.625–3.875	3.625–3.875
No. 1 P.W.	3.625–3.75	3.625–3.75
No. 1 straw	(b)3.375–3.75	(b)3.375–3.75
No. 2 straw	3.25–3.625	3.25–3.625
No. 2 dark	(a)3.375	(a)3.375
U.G.I. gas oil	(b)3.25	(b)3.25
No. 3 fuel	3.25–3.375	3.25–3.4375
No. 6 fuel	(a)$0.50	(a)$0.50
14-16 fuel	(a)$0.85	(a)$0.85
MID-WESTERN		
41-43 grav. w.w.	3.875–4.25	3.875–4.25
42-44 grav. w.w.	4.00–4.625	4.00–4.625
Range oil	(b)3.75–4.00	(b)3.75–4.00
No. 1 p.w.	3.625–3.875	3.625–3.875
No. 1 straw	3.50–3.625	3.50–3.625
No. 2 straw	3.375–3.50	3.375–3.50
No. 3	3.25–3.375	3.25–3.375
No. 5	(a)$0.75	(a $0.75
No. 6	(b)$0.45–$0.55	(b)$0.45–$0.55
N. TEX. (For shpt. to Tex. & N.M. dest'ns.)		
41-43 grav. w.w.	(b)3.875–4.00	(b)3.875–4.00
No. 1 P.W.	(b)3.875	(a)3.875
E. TEX.		
41-43 grav. w.w.	(a)3.50–3.75	(a)3.50–3.75
KANSAS (For Kansas destinations only)		
41-43 gravity w.w.	(b)4.1875–4.25	(b)4.1875–4.25
42-44 gravity w.w.	(a)4.375	(a)4.375
No. 1 p.w.	(b)3.875–4.00	(b)3.875–4.00
No. 6 fuel	(b)$0.60	(b)$0.60
N. LA. (For shipment to La. and Ark.)		
41-43 grav. w.w.	(a)3.875–4.00	(a)3.875–4.00
10-14 gravity	(a)$0.65–$0.70	(a)$0.65–$0.70
ARK. (F.o.b. Ark. plant of one refiner for shipment to Ark. and La.)		
41-43 grav. w.w.	4.25	4.25
No. 1	3.875	3.875
No. 2	3.50	3.50
28-32 zero fuel	3.25	3.25
Tractor Fuel	(h)4.25	(h)4.375
WESTERN PENNA.		
Bradford-Warren:		
45 grav. w.w.	5.00–5.25	5.125–5.25
46 grav. w.w.	(a)5.375	(a)5.375
36-40 gravity	(b)4.75	(a)4.75
Other districts:		
45 grav. w.w.	4.875–5.00	4.875–5.00
46 grav. w.w.	5.00–5.125	5.00–5.125
47 grav. w.w.	5.00–5.25	5.00–5.25
36-40 gravity	(l) 3.875–4.50	(l) 3.875–4.50
CENTRAL MICHIGAN (f)		
47-49 gravity w.w.	4.50–5.00	4.50–5.00
P.W. Distillate	4.375–4.75	4.50–4.75
No. 3 gas oil, Str.	4.00–4.375	4.00–4.50
U.G.I. gas oil	3.00–3.75	3.00–3.75
Fuel Oils (Vis. at 100):		
500-700 Vis.	(b)2.25–3.00	(b)2.25–3.00
300-500 Vis.	(b)2.50–3.25	(b)2.50–3.25
100-300 Vis.	(a)3.25–3.50	(a)3.25–3.50

Prices Effective	April 15	April 8
CALIFORNIA		
40-43 grav. w.w.	4.50–6.00	4.50–6.00
San Joaquin Valley:		
Heavy fuel	$0.55–$0.75	$0.55–$0.75
Light fuel	$0.75–$0.85	$0.75–$0.85
Diesel fuel	2.75–4.00	2.75–4.00
Stove dist.	3.00–5.00	3.00–5.00
Los Angeles:		
Heavy fuel	$0.40–$0.65	$0.40–$0.65
Light fuel	$0.50–$0.75	$0.50–$0.75
Diesel fuel	2.25–4.00	2.25–4.00
Stove dist.	2.25–5.00	2.25–5.00
San Francisco:		
Heavy fuel	$0.80	$0.80
Light fuel	$0.90	$0.90
Diesel fuel	4.50	4.50
Stove dist.	5.50	5.50

Note: All above heavy fuels meet Pacific specification 400: light fuel, spec. 300; Diesel fuels, spec. 200; and stove distillate, spec. 100.

Lubricating Oils

WESTERN PENNA.

Viscous Neutrals — No. 3 col. Vis. at 70° F.

200 Vis. (180 at 100°) 420-425 fl.		
0 p.t.	(a)28.50	(a)28.50
10 p.t.	(a)27.50	(a)27.50
15 p.t.	(a)26.50	(a)26.50
25 p.t.	25.00	25.00–26.00
150 Vis. (143 at 100) 400-405 fl.		
0 p.t.	(a)26.50	(a)26.50
10 p.t.	(a)25.50	(a)25.50
15 p.t.	24.50	(a)24.50
25 p.t.	23.00	23.00–24.00
Cylinder Stocks		
Brt. stk., 145-155 vis. at 210°, 540-550 fl., No. 8 col.		
10 p.t.	(a)25.50	(a)25.50
15 p.t.	(a)24.50	(a)24.50
25 p.t.	23.00	23.00
600 S.R. filterable	13.00	13.00–14.00
650 S.R.	15.00	15.00–16.00
600 fl	16.00	16.00–17.00
630 fl	18.00	18.00–20.00

MID-CONTINENT (F.o.b. Tulsa)

Neutral Oils (Vis. at 100° F. 0 to 10 P.P.)

Pale Oils:

Vis. Color		
60-85—No. 2	6.00–7.50	6.00–7.50
86-110—No. 2	6.25–8.00	6.25–8.00
150—No. 3	10.50–13.75	10.50–13.75
180—No. 3	11.50–14.00	11.50–14.00
200—No. 3	12.00–14.50	12.00–14.50
250—No. 3	13.00–15.50	13.00–15.50
280—No. 3	14.00–17.25	14.00–17.25
300—No. 3	16.00–17.75	16.00–17.75
Red Oils:		
180—No. 5	(a)11.50	(a)11.50
200—No. 5	11.50–13.00	11.50–13.00
280—No. 5	(b)14.75–15.00	(b)14.75–15.00
300—No. 5	(b)13.50–15.25	(b)13.50–15.25

Note: Viscous Neutrals, 15-25 p.p. generally are quoted 0.5c under 0-10 p.p. oils. Non-viscous oils, 15-25 p.p., generally are quoted 0.25c under 0-10 p.p. oils.

Bright Stocks:

200 Vis. at D. 210°	(a)26.00	(a)26.00
150-160 Vis. at 210° D:		
0 to 10 p.p.	21.00–25.00	21.00–25.00
10 to 25 p.p.	20.00–24.50	20.00–24.50
25 to 40 p.p.	(b)20.00–24.00	(b)20.00–24.00
150-160 vis. at 210° E.	19.00–24.00	19.00–24.00
120 Vis. at 210° D:		
0 to 10 p.p.	20.00–23.375	20.00–23.375
25 to 40 p.p.	(a)22.50	(a)22.50
600 S.R. Dark Green	(a)7.50	(a)7.50
600 S.R. Olive Green	8.50–9.50	8.50–9.50
631 S.R.	(a)18.00	(a)18.00
Black Oil	(b)4.00–5.50	(b)4.00–5.50

SOUTH TEXAS Neutral Oils

Vis. Color		
Pale Oils: (*Vis. at 100°F*)		
100 No. 1½-2½	5.75–6.00	5.75–6.00
200 No. 2-3	7.50–7.75	7.50–7.75
300 No. 2-3	8.00–8.25	8.00–8.25
500 No. 2½-3½	9.00–9.25	9.00–9.25
750 No. 3-4	9.50–9.75	9.50–9.75
1200 No. 3-4	9.875–10.50	9.875–10.50
2000 No. 4	10.00–10.75	10.00–10.75
Red Oils:		
200 No. 5-6	7.50–7.75	7.50–7.75
300 No. 5-6	8.00–8.25	8.00–8.25
500 No. 5-6	9.00–9.25	9.00–9.25
750 No. 5-6	9.50–9.75	9.50–9.75
1200 No. 5-6	9.875–10.50	9.875–10.50
2000 No. 5-6	10.00–10.75	10.00–10.75

Lubricating Oils (Cont'd.)

Prices Effective	April 15	April 8
CHICAGO		
Neutral Oils (Vis. at 100° F. 0 to 10 p.p.		
Pale Oils		
Vis. Color		
60-85—No. 2	7.75	7.75
86-110—No. 2	8.00	8.00
150—No. 3	11.25	11.25
180—No. 3	12.50	12.50
200—No. 3	13.00	13.00
250—No. 3	14.00	14.00
Red Oils:		
180—No. 5	12.00	12.00
200—No. 5	12.50	12.50
250—No. 5	13.00	13.00
280—No. 5	13.50	13.50
300—No. 5	14.00	14.00

Note: Viscous oils, 15 to 30 p.p. are quoted 0.5c lower; 60-85 and 86-110 No. 2 non-viscous oils, 15 to 30 p.p., 0.25c lower.

Unfiltered Steam Refined: (Viscosity at 210°)		
140	9.50	9.50
160	10.50	10.50
200	11.50	11.50
Bright stocks, 160 vis. at 210, No. 8 color:		
0 to 10 p.p.	21.75	21.75
15 to 25 p.p.	20.75	20.75
30 to 40 p.p.	20.25	20.25
E filtered Cyl. Stock	14.00	14.00

Note: To obtain prices delivered in Chicago, add 0.25c per gal.

Natural Gasoline

(Group 3 & Breckenridge prices are to blenders on freight basis shown below. Shipments may originate in any Mid-Continent manufacturing district.)

FOB GROUP 3		
Grade 26-70	(k)1.50	(k)1.50
FOB BRECKENRIDGE		
Grade 26-70	(i)1.25	(i)1.25
CALIFORNIA (FOB plants in Los Angeles basin)		
75-85, 350-375 e.p. for blending	6.00–6.25	6.00–6.25

Naphtha and Solvent

(FOB Group 3 as quoted by Chicago sellers)

Stoddard solvent	5.875–6.375	6.375
Cleaners' naphtha	6.375–6.875	6.875
V. M. & P. naphtha	6.375–6.875	6.875
Mineral spirits	5.375–5.875	5.875
Rubber solvent	6.375–6.875	6.875
Lacquer diluent	6.625–7.875	7.875
Benzol Diluent	8.375	8.375

Wax

White Crude Scale:

WESTERN PENNA. (Bbls., C.L., N. Y.)		
122-124 A.m.p.	4.75	4.65–4.80
124-126 A.m.p.	4.75	4.65–4.90
OKLAHOMA (Bbls. or burlap bags, C.L.)		
124-126 A.m.p.	(b)5.00	(b)5.00

CHICAGO (FOB Chicago district refinery of one refiner, in bags or slabs loose, carloads. Melting points are EMP (ASTM) methods; add 3° F. to convert into AMP.)

Fully refined:		
122-124 (bags only)	6.10	6.10
125-127	6.10	6.10
127-129	6.35	6.35
130-132	6.65	6.65
132-134	6.90	6.90
135-137	7.65	7.65

Petrolatums

WESTERN PENNA. (Bbls., carloads; tank cars, 0.5c per lb. less.)

Snow White	6.625–7.00	6.625–7.00
Lily White	5.75–6.00	5.75–6.00
Cream White	4.75–5.00	4.75–5.00
Light Amber	3.625–3.75	3.625–3.75
Amber	3.375–3.625	3.375–3.625
Red	3.125–3.375	3.125–3.375

(a) One refiner quoting. (b) Two refiners quoting. (e) No quotations reported. (f) Prices FOB Central Michigan refinery group basis for shipment within Michigan: shipments may originate at plants outside Central group. (g) Excluding Detroit shipment. (h) For shipment to Ark. points only. (i) Quotations. (j) Sale. (k) Sales. (l) Pittsburgh district prices excluded. (m) Three refiners quoting. (n) Four refiners quoting. (o) Five refiners quoting. (p) Six refiners quoting. (r) Seven refiners quoting. (s) Eight refiners quoting. (t) Nine refiners quoting. (u) Ten refiners quoting. (v) Eleven refiners quoting. (w) Twelve refiners quoting. (x) Thirteen refiners quoting. (y) Fourteen refiners quoting.

SEABOARD PRICES EXPORT AND COASTWISE

Atlantic Coast

(Prices are of refiners, FOB their refineries & their tanker terminals, & of tanker terminal operators, FOB their terminals)

Prices Effective April 15

MOTOR GASOLINE (ASTM Octane)

District:	72-74 Oct.	68-70 Oct.	65-66 Oct.	60-64 Oct.	KEROSINE and/or NO. 1 FUEL
N. Y. Harb.	6.25 – 7.20	6.25 – 6.50	6.25	6.25 – 6.70	5.90 – 6.25
N. Y. Harb., barges	6.00 – 7.20	6.00 – 6.25	6.00 – 6.25	6.00 – 6.70	5.80 – 6.25
Albany	7.10 – 7.80	.....	.....	.....	(c)6.00
Philadelphia	6.25 – 7.75	6.25 – 6.75	(d)6.25 –6.50	6.25 – 6.75	6.00 – 6.25
Baltimore	6.25 – 7.75	6.25 – 7.00	(d)6.25	6.25 – 6.75	6.00
Norfolk	7.00 – 7.75	6.50 – 7.00	(c)6.75	(d)6.50 –6.75	5.50 – 5.75
Wilm'ton	7.00 – 7.85	6.50 – 7.00	(c)6.75	6.25 – 6.75	5.50 – 6.00
Char'ston	7.00 – 7.55	(d)7.00	(c)6.75	6.50 – 6.75	(d)5.50 –5.75
Savannah	7.00 – 7.25	6.50 – 7.00	.....	6.25 – 6.75	5.50 – 5.625
Jacksonville	7.00 – 7.25	6.50 – 7.00	.....	6.25 – 6.75	5.50 – 5.625
Miami	(d) 7.00 –7.25	(c)7.00	.....	(d) 6.25 –6.75	(c) 5.50 –5.625
Tampa	6.75 – 7.25	(d) 6.375–7.00	.....	6.25 – 6.75	5.50 – 5.625
Pensacola	(c) 7.00 –7.25	.....	.....	(c) 6.50 –6.75	(c) 5.50 –5.625
Mobile	6.75 – 7.00	(c)6.25	.....	6.00 – 6.50	(c) 5.50 –5.625
Portland	7.10	(c)7.00	.....	.....	(d)6.20
Boston	6.25 – 7.00	(c)6.75	6.75 – 7.00	6.00 – 6.75	6.00 – 6.10
Providence	6.25 – 7.30	.....	(d) 6.75 – 7.00	6.75 – 6.80	6.00 – 6.10

FUEL OILS

	Nos. 2-3	No. 4	No. 5	No. 6
N. Y. Harb.	5.40 – 5.60	5.40 – 6.00	$1.70 –$1.85	$1.50
N. Y. Harb., barges	5.30 – 5.50	5.30 – 6.00	.....	.....
Albany	(d)5.50	(d)5.50	(c)$2.00	(c)$1.70
Philadelphia	5.00 – 5.50	4.75 – 5.25	$1.46 –$1.70	$1.25 –$1.50
Baltimore	(d) 5.00 – 5.50	4.75 – 5.50	(c)$1.47	$1.25 –$1.50
Norfolk	(c)5.50	.....	.....	(c)$1.50
Wilmington	5.00 – 5.50	(c)5.25	.....	.....
Charleston	(c)5.50	.....	.....	.....
Savannah	.....	.....	.....	(c)$1.45
Jacksonville	(c)5.00	(c)5.00	.....	(c)$1.45
Tampa	(c)5.00	.....	.....	(c)$1.40
Portland	(d)5.70	(c)5.70	(c)$2.10	(d)$1.60
Boston	5.50 – 5.60	(c)5.50	(d)$1.80	(d)$1.50
Providence	5.50	(d)5.50	(d) $1.75–$1.80	(d)$1.50

	Bunker C Fuel Ships' bunkers	Diesel Oil Ships' bunkers	Diesel Oil Shore Plants	Gas House 28-34	Gas Oil Gravity
N. Y. harbor	$1.50	$2.20 –$2.35	5.40	5.50	
Albany	(c)$1.70	.....	5.50	.....	
Philadelphia	$1.25 –$1.50	$2.10 –$2.35	.....	.....	
Baltimore	(d)$1.50	$2.20	.....	.....	
Norfolk	(c)$1.50	$2.10 –$2.35	.....	.....	
Charleston	.....	$1.90 –$2.31	.....	.....	
Savannah	(c)$1.45	$1.995	.....	.....	
Jacksonville	(c)$1.45	$1.995–$2.10	5.00	.....	
Tampa	(c)$1.40	$1.995–$2.10	5.00	.....	
Portland	(d)$1.60	$2.30	5.70	5.80	
Boston	(d)$1.50	$2.20 –$2.35	5.50	5.60	
Providence	(d)$1.50	$2.20 –$2.35	5.50	5.60	

New York Export Lubes

(Penna. Products in bbls. FAS New York)

Prices Effective	April 15	April 8
Bright stock:		
Light, 25 p.t.	(b) 29.00–31.50	(b) 31.00–31.50
Neutral oil:		
200 3 color, 25 p.t.	(a)31.00	(a)33.00
150 3 color, 25 p.t.	(b) 29.00–31.50	(b) 31.00–31.50
600 s.r., unfilt.	(b) 19.00–21.50	(b) 21.00–21.50
650 s.r., unfilt.	(b) 20.00–23.50	(b) 23.00–23.50
600 fl. s.r.	(b) 21.00–24.50	(b) 24.00–24.50
630 fl., s.r.	(b) 26.00–28.00	(b)28.00

Wax

(A.S.T.M. Tests. Melting points, however, are A.M.P., 3° higher than E.M.P. Export prices, FAS. c.l. Domestic prices, FOB. refr'ies., in bags, c.l., with 0.2c discount allowed for shipment in bulk, except where noted. Scale solid; fully refined slabs in bags)

Prices Effective April 15

	New Orleans Export	N. Y. Domestic	N. Y. Export
Crude Scale:			
124-6 Yellow	(a)4.75	.....	(a)4.75
122-4 White	.....	4.65 –4.75	4.65 –4.75
124-6 White	(b)4.75–5.00	4.65 –4.75	4.65 –4.75
Fully Refined:			
123-5	.....	(a)6.25	(a)6.625
125-7	(a)6.75	(a)6.30	(b)6.75
128-30	(a)7.00	(b&i)6.10-6.40	(b)7.00
130-2	(a)7.25	(a&i)6.60	(b)7.25
133-5	(a)7.75	(b&i)6.65-6.85	(b)7.75
135-7	(a)8.25	.....	(b)8.25
108-11 White Match	.....	.....	(a&j)5.15

Naphtha

Prices Effective April 15	V.M.&P. Naphtha	Mineral Spirits
Baltimore	9.50	8.0–8.5
New York Harbor	9.0–9.5	8.5–9.0
Philadelphia district	10	8.25–9
Boston	9.5	9.25 –9.50
Providence	9.5	9.5
†Ohio points, delivered	8.75	*8.25

*This is on rubber solvent.

†Ohio prices are those of S. O. Ohio. Its prices for D.C. naphtha, special Varnolene, Varnolene and Sohio Solvent are same as for V.M.&P.

Pacific Export

(Quotations at seaboard, Los Angeles, cargo lots, except where otherwise noted.)

Prices Effective	April 15	April 8
375 e.p. blend, 70 oct.	6.375– 6.75	6.375– 6.75
390 e.p. blend, 68 oct.	6.25 – 6.50	6.25 – 6.50
390 e.p. blend, 66 oct.	6.125– 6.375	6.125– 6.375
400 e.p. blend, 65 oct. min.	6.00 – 6.25	6.00 – 6.25
U. S. Motor, under 65 octane	5.75 – 6.00	5.75 – 6.00
(m) 38-40 gravity, w.w. kerosine	4.25 – 5.00	4.25 – 5.00
41-43 grav., w.w. kero.	4.50 – 5.00	4.50 – 5.00
44 grav., w.w. kero.	5.00 – 5.50	5.00 – 5.50
Diesel fuel, 24 & above	$1.25 –$1.35	$1.25 –$1.35
Diesel fuel, under 24	$1.15 –$1.25	$1.15 –$1.25
(n) 30-34 grav., diesel (gas oil)	$1.25 –$1.35	$1.25 –$1.35
(o) Grade C fuel	$0.68 –$0.73	$0.68 –$0.73
In Ships' Bunkers, or deep tank lots:		
(n) Diesel fuel	$1.35 –$1.45	$1.35 –$1.45
(o) Grade C fuel	$0.85 –$0.90	$0.85 –$0.90
Cased Goods: (Per case)		
U. S. M.	$1.45 –$1.55	$1.45 –$1.55
375-400 e.p. blend, 65 oct. & above	$1.60 –$1.70	$1.60 –$1.70
400 e.p. blend, under 65 oct.	$1.50 –$1.60	$1.50 –$1.60
(m) 40-43 grav., w.w. kero	$1.40 –$1.50	$1.40 –$1.50
Kero., p.w.	$1.30 –$1.45	$1.30 –$1.45

Tanker Rates

(Approximate rates. Cents per bbl.)

Gulf-N. Atlantic: (not E. of N.Y.)	Last Paid	Owners Ask
Hvy. Crude & fuel, (10 to 19.9 gravity)	53	.....
Light Crude, (30 Grav. or Lighter)	47	.....
Gasoline	60	.....
Kerosine	63.50	.....
Light Fuel	70	.....

Gulf Coast

(FOB ship at Gulf for domestic and export; min. 20,000 bbls.)

Prices quoted by individual GCRA refiners on their products meeting GCRA specifications follow

April 15	
GCRA Spec. Motor Fuels (CFR octane)	
72-74 octane leaded	(b) 5.75 –6.25
72-74 octane unleaded	.....
70 octane unleaded	(b) 5.875–6.25
68 octane unleaded	(b) 5.75 –6.25
65 octane unleaded	(b) 5.50 –6.00
GCRA Spec. Kerosine & Gas Oils	
Kerosine	(a)4.625
43 or below diesel index gas oil	(e)
43-47 diesel index gas oil	(a)4.00
48-52 diesel index gas oil	(a)4.25
53-57 diesel index gas oil	(s)4.375
58 & above	(a)4.50

Prices quoted by refiners for other products follow:

MOTOR GASOLINE (ASTM Octane)

April 15

	60-62 Gravity, 400 e.p.	61-63 Gravity, 390 e.p.	64-66 Gravity, 375 e.p.
72-74 oct. leaded	5.25-6.25	(a)6.00	(a)6.00
70 oct. unleaded	(b)5.875-6.25	(a)6.125	(a)6.25
68 oct. unleaded	5.50-6.25	(b)5.875-6.00	(b)6.00
65 oct. unleaded	5.25-6.00	(b)5.50-5.625	(b)5.625-5.75
60 oct. unleaded	5.00-5.25	(b)5.25-5.375	(b)5.375-5.50

KEROSINE, GAS & FUEL OILS

	April 15	April 8
41-43 grav. w.w. kero.	(b) 4.50 –4.625	4.50 – 4.625
Gas Oil (Less than ½ of 1% sulfur)		
Below 43 diesel index	(a)4.00	(a)4.00
43-47 diesel index	4.00	4.00
48-52 diesel index	4.00 – 4.25	4.00 – 4.25
53-57 diesel index	(b) 4.125–4.375	(b) 4.125–4.375
58 & above	(a)4.50	(a)4.50
No. 2 fuel	(b) 4.00 –4.125	4.00 – 4.125
(g) Diesel oil, ships' bunkers	$1.70	$1.70
(g) Grade C, ships' bunkers	$0.90 –$1.00	$0.90 –$1.00
Grade C cargoes	$0.75 –$0.95	$0.75 –$0.98

MID-CONTINENT LUBES

(At Gulf; in packages, FAS.; in bulk FOB terminals)

	April 15 (l) Packages	Bulk
200 vis. D. 210 brt. stock	(b)33.50	(b)27.80
200 vis. E 210 brt. stock	(e)	(e)
150 vis. D 210 brt. stock 0-10 p.p.	(b) 29.50–31.50	(b)23.80–25.80
10-25 p.p.	(a)28.50	(a)22.80
150 vis. E 210 brt. stock	(e)	(e)
100 vis. D 210 brt. stock 0-10 p.p.	(a)28.50	(a) 22.80
10-25 p.p.	(a)27.50	(a)21.80
200 vis. No. 3 col. neutral:		
0-10 p.p.	(a)20.50	(a)14.80
10-25 p.p.	(a)20.00	(a)14.30
180 vis. No. 3 col. neutral:		
0-10 p.p.	(a)20.00	(a)14.30
10-25 p.p.	(a)19.50	(a)13.80

SOUTH TEXAS LUBES

(Vis. at 100°, c. t. 0, blk. exprt. shp., FOB terminals.)

Unfiltered Pale Oils:		April 15	April 8
Vis.	Color		
100	No. 3	6.00 – 6.50	6.00 – 6.50
200	No. 3	7.50 – 8.50	7.50 – 8.50
300	No. 3	8.00 – 9.00	8.00 – 9.00
500	No. 3½	9.00 –10.50	9.00 –10.50
750	No. 4	9.50 –11.00	9.50 –11.00
1200	No. 4	10.00 –13.50	10.00 –13.50
2000	No. 4	10.25	10.25
Red Oils:			
Vis.	Color		
100	No. 5-6	6.00 – 6.50	6.00 – 6.50
200	No. 5-6	7.50 – 8.50	7.50 – 8.50
300	No. 5-6	8.00 – 9.00	8.00 – 9.00
500	No. 5-6	9.00 –10.50	9.00 –10.50
750	No. 5-6	9.50 –11.00	9.50 –11.00
1200	No. 5-6	10.00 –13.50	10.00 –13.50
2000	No. 5-6	10.25	10.25

(a) One refiner quoting. (b) Two refiners quoting. (c) One supplier quoting. (d) Two suppliers quoting. (e) No quotations reported. (g) Lighterage, additional at some points, not included. (i) Shipment in bags or in bulk. (j) Shipment in tight barrels. (l) New steel drums. (m) 150 fire point. (n) Pacific Specification 200. (o) Pacific Specification 400.

TANK WAGON PRICES

Commercial or consumer tank car, tank wagon, dealer, and service station prices for gasoline **do not include taxes;** *they do, however, include inspection fees as shown in general footnote. Gasoline taxes, shown in separate column, include 1c federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes; kerosine taxes, where levied, are indicated in footnotes. Dealer discounts are shown in footnotes; for commercial consumer discounts, see NPN for Feb. 21, 1940. These prices in effect April 15, 1940 as posted by principal marketing companies at their headquarters offices, but subject to later correction.*

S. O. New Jersey

Esso (*Regular Grade*)

	Consumer Tank Car	Dealer T.W.	Gasoline Taxes	Kerosine T.W.
*Atlantic City, N. J.	7.6	8.7	4	8.4
*Newark, N. J.	7.6	8.7	4	8.4
Annapolis, Md.	8.35	9.35	5	9.50
Baltimore, Md.	7.75	8.75	5	8.5
Cumberland, Md.	9.15	10.15	5	10
Washington, D. C.	8.0	9	3	9.5
Danville, Va.	8.95	11.45	6	11.5
Norfolk, Va.	7.75	10.25	6	11
Petersburg, Va.	8.05	10.55	6	11.7
Richmond, Va.	8.05	10.55	6	11
Roanoke, Va.	9.25	11.75	6	11.5
Charleston, W. Va.	8.55	11.05	6	12.6
Parkersburg, W. Va.	7.85	9.85	6	11.2
Wheeling, W. Va.	8.85	10.75	6	11.8
Charlotte, N. C.	9.9	11.4	7	11.8
Hickory, N. C.	10.45	11.95	7	12.3
Mt. Airy, N. C.	10.3	11.8	7	12.2
Raleigh, N. C.	9.65	11.15	7	11.5
Salisbury, N. C.	9.95	11.45	7	11.9
Charleston, S. C.	7.75	10.25	7	9.25
Columbia, S. C.	8.6	11.1	7	11.5
Spartanburg, S. C.	9.3	11.8	7	12.2

	Mineral Spirits T.W.	V.M.&P. T.W.
Newark, N. J.	11.5	15.5
Baltimore, Md.	13.5	....
Washington, D. C.	15	....

*Effective Sept. 14, 1939, minimum retail resale price of 11.9c posted thru New Jersey.

Discounts:

Esso gasoline—to undivided dealers, 0.5c off dealer t.w. price, thru territory, except New Jersey. While above posted prices continue at Atlantic City and Newark, dealers will pay net price of 8.0c per gal. for Esso; dealers having pumps marked only Esso, Esso Extra and Standard White gasoline will pay 8.1c per gal. for Esso.

Kerosine—1c off t.w. price for 25 gals. or more, under contract thru territory (Baltimore city contract not necessary) except no discount in state of New Jersey.

Naphthas—To buyers taking following quantities at one time: Newark, 2c per gal. on 200 gals. or more, less than 200 gals. 0.5c higher price; Baltimore, 2c off on 25 to 100 gals. and 3c on over 100 gals.; Washington, 2c off to contract buyers.

Socony-Vacuum Oil Co., Inc.

Socony Mobilgas (*Regular Grade*)

	Consumer Tank Car	"Split" Dealer T.W.	Gasoline Taxes	†† Kerosine T.W.
Metropolitan N. Y. City: Boroughs of Manhattan, Bronx and Brooklyn (Kings and Queens)	7.2	8.8	*5	8.8
Borough of Richmond (Staten Is.)	7.2	8.8	*5	8.8
Albany, N. Y.	7.1	9.1	5	8
Binghamton, N. Y.	8.4	9.5	5	9.6
Buffalo, N. Y.	7.6	9.5	5	8
Jamestown, N. Y.	7.2	9.2	5	7.9
Plattsburg, N. Y.	7.6	9.1	5	9.2
Rochester, N. Y.	7.8	9.8	5	8.6
Syracuse, N. Y.	7.7	9.5	5	9.1
Bridgeport, Conn.	7.3	8.3	4	8.3
Danbury, Conn.	7.8	9.1	4	9.3
Hartford, Conn.	7.4	9.3	4	7.8
New Haven, Conn.	7.3	8.3	4	7.8
Bangor, Me.	7.4	9.7	5	8
Portland, Me.	7.1	9.1	5	8.5
Boston, Mass.	7	8	4	8.5
Concord, N. H.	7.9	10.2	5	9.1
Lancaster, N. H.	8.7	11.2	5	9.9
Manchester, N. H.	7.7	9.5	5	8.9
Providence, R. I.	7	9	4	8.5
Burlington, Vt.	7.6	9.9	5	9
Rutland, Vt.	8	10.3	5	9.2

	Mineral Spirits T.W.	V.M.&P. T.W.
Buffalo, N. Y.	11.5	12.5
†New York City	8.9	9.5
Rochester, N. Y.	12.5	12.5
Syracuse, N. Y.	12.5	15
Boston, Mass.	11.5	11.5
Bridgeport, Conn.	11.5	12
Hartford, Conn.	11	11.5
Providence, R. I.	11.5	12.5

Fuel Oils—T.W.	Nos. 2 & 3	No. 4
New York City	7.30	7.30
Albany, N. Y.	7.50	7.00
Rochester, N. Y.	7.80	7.80
Boston, Mass.	7.50	7.50
Bangor, Me.	7.90	7.90
Manchester, N. H.	7.30	7.30
Burlington, Vt.	8.20	8.20

Fuel Oils—T.W.—(Cont'd)

	Nos. 2 & 3	No. 4
Hartford, Conn.	7.60	7.60
New Haven, Conn.	7.50	7.50
Providence, R. I.	7.50	7.50

*Plus 2% city sales tax computed at time of each sale.

†Prices apply to consumers only in quantities over 1000 gals. annually; for quantities under 1000 gals. annually, add 0.5c per gal.

††Same prices apply for No. 1 fuel.

Discounts: Gasoline—To undivided dealers, 0.5c less than "split" dealer t.w.

Atlantic Refining

Atlantic White Flash Gasoline (*Regular Grade*)

	Commercial T.C.	Dealer T.W.	Gasoline Taxes	Kerosine T.W.
Philadelphia, Pa.	7	8.5	5	10.5
Pittsburgh	8	9.5	5	10.5
Allentown	8	9.5	5	10.5
Erie	8	9.5	5	10
Scranton	7.5	10	5	10.5
Altoona	8	10	5	10.5
Emporium	8	10	5	10.5
Indiana	8	10	5	10.5
Uniontown	8	10	5	10.5
Harrisburg	8	9.5	5	10.5
Williamsport	8.5	10	5	10.5
Dover, Del.	....	9	5	10.5
Wilmington	....	8.5	5	10
Boston, Mass.	....	8	4	8.5
Springfield, Mass.	....	9	4	9.0
Worcester, Mass.	....	9.1	4	8
Fall River, Mass.	....	8.5	4	8.5
Hartford, Conn.	....	9.3	4	8.5
New Haven, Conn.	....	8.3	4	8.5
Providence, R. I.	....	9	4	8.5
Atlantic City, N. J.	....	8.6	4	8.1
Camden, N. J.	....	8.6	4	8.1
Trenton, N. J.	....	7.6	4	8.1
Annapolis, Md.	....	9.35	5	10.5
Baltimore, Md.	....	8.75	5	9.5
Hagerstown, Md.	....	9.85	5	10
Richmond, Va.	....	10.55	6	11
Wilmington, N. C.	....	10.35	7	10.8
Brunswick, Ga.	....	10	7	*11
Jacksonville, Fla.	....	9	8	10

	Mineral Spirits T.W.†	V.M.&P. T.W.†
Philadelphia, Pa.	12	14.5
Lancaster, Pa.	13.5	16
Pittsburgh, Pa.	14.5	14.5

Fuel Oils—T.W.	1	2	3	4	5	6
Phila., Pa.	8.5	7.00	7.00	7.00	4.25	3.50
Allentown, Pa.	8.5	6.5	6.5	6.5	....	....
Wilmington, Del.	8.00	7.00	7.00	7.00	....	....
Springfield, Mass.	9.0	8.0	....	....	....	....
Worcester, Mass.	8	7	....	7	....	....
Hartford, Conn.	8.5	7.6	....	7.6	....	....

*Does not include 1c Georgia kerosine tax.

†Mineral Spirits prices also apply to Stoddard Solvent; V.M.&P. prices also apply to Light Cleaners Naphtha.

Discounts:

Gasoline—to undivided dealers, 0.5c off dealer t.w., except Georgia & Florida dealer t.w. and undivided dealer t.w. prices are same. At Scranton, Pa., 1c per gal. voluntary discount allowed to dealers only.

Kerosine—Thru Penna. & Delaware, 2c off t.w. price on t.w. deliveries of 25 gals. or more at one time.

Naphthas—Philadelphia, 200 gals. or more at one time, 2c off Lancaster, contract buyers taking 1000 gals. or more per year, one drum up, 2c off; non-contract buyers, 200 gals. or more at one time, 2c off. Pittsburgh, 500 gals. or more at one time, 2c off.

S. O. Ohio

***Sohio X-70 Gasoline (*Regular Grade*)**

	Consumer T.W.	Divided Dlr.	‡S.S.	Gasoline Taxes	†Kerosine T.W.
Ohio, Statewide	10.5	9.5	12.5	5	8
Akron	10.5	8	10	5	8
Cincinnati	10.5	9	11.5	5	8
Cleveland	10.5	8.5	11	5	8
Columbus	10.5	9	11.5	5	8
Dayton	10.5	9	11.5	5	8
Marietta	10.5	9	11.5	5	8
Portsmouth	10.5	9.5	12.5	5	8
Toledo	10.5	7.5	9.5	5	8
Youngstown	10.5	9	11.5	5	7.5

Esso Aviation Gasoline—Thru Ohio

	Consumer T.W.	Gasoline Taxes
74 octane	15.5	5
80 octane	16.5	5
87 octane	17.5	5

S. O. Ohio (Cont'd)

	S.R. Solvent	**V.M.&P Naphtha
Thru Ohio—T.W.	12.5	13

††Fuel Oils—T.W.

	No. 1	No. 2	No. 3
Toledo	7.50	7.00	7.00
Rest of Ohio	7.50	7.50	7.00

*Renown (third-grade) prices are same as X-70 unless otherwise noted.

†Kerosine prices do not include 1c Ohio tax.

‡Prices at company-operated stations

**V.M.&P. prices also apply on Cleaners naphtha, special Varnolene and Sohio Solvent.

††Prices are for full compartment hose dumps; bucket dumps are 0.5c per gal. higher.

Discounts:

X-70 gasoline—to undivided dealers, 0.5c off dealer t.w.

Esso aviation—on contract to hangar operators and resellers, 2c off consumer t.w.

Naphthas—to contract consumers off t.w. prices: 300 to 999 gals., 0.5c; 1000 to 2499 gals., 0.75c; 2500 to 4999 gals., 1c; 5000 or more gals., 1.5c.

S. O. Kentucky

Crown Gasoline (*Regular*)
Standard or Kyso (*Third Grade*)

	Crown	†Net Dealer ††Standard or Kyso	Gasoline Taxes	Kerosine T.W.
Covington, Ky.	8.5	7.5	6	9.5
Lexington, Ky.	10.5	9	6	10
Louisville, Ky.	9.5	7.5	6	9
Paducah, Ky.	9.5	8	6	9
Jackson, Miss.	9	8	7	*9.5
Vicksburg, Miss.	9	8	7	*9
Birmingham, Ala.	10.5	8	*8	9
Mobile, Ala.	9.5	7.5	*9	8
Montgomery, Ala.	10.5	9	*9	*10
Atlanta, Ga.	11	8.5	7	*10
Augusta, Ga.	10.5	9.5	7	*9
Macon, Ga.	9.5	8.5	7	*10
Savannah, Ga.	9.5	8	7	*8
Jacksonville, Fla.	9	8	8	8
Miami, Fla.	9	8	8	8
Pensacola, Fla.	9.5	8	*9	8.5
Tampa, Fla.	10	9	8	8

*Taxes: In tax column are included these city and county gasoline taxes: Mobile, 2c city; Birmingham, 1c city; Montgomery, 1c city and 1c county; Pensacola, 1c city. Georgia and Montgomery, Ala. have 1c kerosine tax, Mississippi 0.5c, not included in above prices.

†Consumer t.w. prices are same as net dealer prices except at Tampa. Tampa consumer t.w. prices are Crown 13c, Standard 11.5c.

††Standard, a leaded 3rd grade, is sold in Ky., Ala., Ga., and Fla.; Kyso, an unleaded 3rd grade, is sold in Miss.

Discounts:

Gasoline—Tampa: Temporary discount of 3c on Crown, 2.5c on Standard, off Consumer T.W. prices which see above.

S. O. Indiana

Red Crown (*Regular Grade*)
Stanolind (*Third Grade*)

	Red Dealer Prices Crown Cons. T.W.	Red Crown	Stanolind	Gasoline Taxes	Kerosine T.W.
Chicago, Ill.	11.1	9.1	6.9	4	10
Decatur, Ill.	11.1	8.1	6	4	9.5
Joliet, Ill.	11.1	9.6	6.7	4	10
Peoria, Ill.	11.1	8.7	8.1	4	10
Quincy, Ill.	10.9	9.4	8.5	4	9.8
Indianapolis, Ind.	11.8	9.3	8.8	5	*10.2
Evansville, Ind.	11.6	10.1	9.4	5	*10.5
South Bend, Ind.	11.8	10.3	8.8	5	*10.2
Detroit, Mich.	9.6	8.1	7.6	4	7.6
Grand Rapids, Mich.	9.2	7.7	7.2	4	9
Saginaw, Mich.	10.8	8.7	8.2	4	9.3
Green Bay, Wis.	11.9	10.4	9.9	5	10.3
Milwaukee, Wis.	11.3	9.8	9.3	5	10.2
La Crosse, Wis.	11.5	10	9.5	5	10.4
Minneapolis-St. Paul	11.5	9.5	9	5	10.4
Duluth, Minn.	11.9	10.4	9.9	5	10.8
Mankato, Minn.	11.5	10	9.5	5	10.4
Des Moines, Ia.	10.9	8.4	7.4	4	*9.8
Davenport, Ia.	11.1	9.6	8.4	4	*10
Mason City, Ia.	11.3	9.8	6.9	4	*10.2
St. Louis, Mo.	10.7	9.2	7.5	*4	8
Kansas City, Mo.	10.4	8.9	6.9	*4	8
St. Joseph, Mo.	10.4	8.0	7.5	*4	7.9
Fargo, N. D.	12.7	11.2	10.7	5	11.6
Huron, S. D.	12	10.5	10	5	10.9
Wichita, Kans.	9.3	7.1	5.5	4	7

(Continued on next page)

TANK WAGON PRICES

Commercial or consumer tank car, tank wagon, dealer, and service station prices for gasoline **do not include taxes;** *they do, however, include inspection fees as shown in general footnote. Gasoline taxes, shown in separate column, include 1c federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes; kerosine taxes, where levied, are indicated in footnotes. Dealer discounts are shown in footnotes; for commercial consumer discounts, see NP N for Feb. 21, 1940.*

These prices in effect April 15, 1940 as posted by principal marketing companies at their headquarters offices, but subject to later correction.

S. O. Indiana (Cont'd)

Stanavo Aviation 73 Octane

Chicago, Ill.	14.9		
Detroit, Mich.	16.5	4	
Milwaukee, Wis.	15.1	5	
Minneapolis, Minn.	15.3	5	
St. Louis, Mo.	14.5	3	
Kansas City, Mo.	14.2	*4	
Fargo, N. D.	16.5	5	
Huron, S. D.	15.8	5	

	Oleum Spirits	V.M.&P. Naphtha	Stanisol	*Taxes
	(Prices are base prices before discounts)			
Chicago	12.7	13	12.4	4
Detroit	15.2	14.7	15.7	4
K. C., Mo.	12.9	13.9	13.4	1
St. Louis	13.2	14.2	12.4	1
Milwaukee	13.8	14.8	14.3	5
Minnep'ls	14	15	12.7	5

†Fuel Oils—T.W.	No. 1 Fuel	Stanolex Furnace
Chicago	**6.75	6.75
Indianapolis	....	*7.5
Detroit	....	6.6
Milwaukee	8.2	7.7
Minneapolis	7.5	7.5
St. Louis	7.0	6.75
Kansas City	6.8	6.8

*Taxes: In gasoline tax column are included these city taxes—Kansas City, St. Joseph, and St. Louis, 1c. Indiana kerosine and fuel oil prices are ex 4c state tax; Iowa kerosine prices are ex 3c state tax. In naphtha tax column are included 1c federal tax and state taxes.

†Prices for small-lot deliveries range up to 2c higher than above prices.

**For 400 gals. & over; 150 to 399 gals., 7.25c; 1 to 149 gals., 8.25c.

S. O. Nebraska

Standard Red Crown Gasoline (*Regular Grade*)

	T.W.	Dealer	Gasoline Taxes	Kerosine T.W.
Omaha, Neb.	10.5	7.5	6	9.8
McCook	10.5	7.4	6	9
Norfolk	10.5	8.4	6	9.5
North Platte	11.8	8.9	6	10
Scottsbluff	12.5	9.5	6	10

S. O. Louisiana

Esso (*Regular Grade*)

	Consumer Tank Car	Dealer T.W.	Gasoline Taxes	Kerosine T.W.
Little Rock, Ark.	7.25	9.75	7.5	10
Alexandria, La.	6.75	9.25	8	*9.5
Baton Rouge, La.	6.75	9.25	8	*9.5
New Orleans, La.	6.75	9.25	8	*9
Lake Charles, La.	6.75	9.25	8	*11.5
Shreveport, La.	5.5	8	8	*8
Lafayette, La.	7	9.5	8	*9
Bristol, Tenn.	10.25	9.75	8	12
Chattanooga, Tenn.	9.5	11	8	12
Knoxville, Tenn.	10	11.5	8	12.5
Memphis, Tenn.	8	9.5	8	11
Nashville, Tenn.	9	10.5	8	11.5

*New Orleans kerosine price is ex 1c parish tax, and all Louisiana kerosine prices are ex 1c state tax.

Discounts:

Esso gasoline—to undivided dealers, 0.5c off dealer t.w.

Humble Oil & Refining Co.

Humble Motor Fuel (*Regular Grade*)

	*T.W.	S.S.	Gasoline Taxes	Kerosine T.W.
Dallas, Tex.	7	11	5	7
Ft. Worth, Tex.	7	11	5	7
Houston, Tex.	8.5	12.5	5	8
San Antonio, Tex.	8	12	5	8

Thriftane (Leaded, 67 Octane, Purple Gasoline)

Dallas	5.5	9	5
Ft. Worth	5.5	9	5
Houston	7	10.5	5
San Antonio	6	10	5

74 Octane Aviation Gasoline, Clear

	Tank Car
FOB Baytown, Tex.	8.5

*To all classes of dealers & consumers.

The Texas Co.

	Gasoline—Dealer T.W. Fire-Chief (*Regular*)	Indian (*3rd Grade*)	Gasoline Taxes
Dallas, Tex.	7	5	5
Ft. Worth, Tex.	7	5	5
Wichita Falls, Tex.	8	5	5
Amarillo, Tex.	8	5	5
Tyler, Tex.	8	5	5
El Paso, Tex.	8	7	5
San Angelo, Tex.	7.5	5	5
Waco, Tex.	7.5	5	5
Austin, Tex.	8.5	7	5
Houston, Tex.	8.5	7	5
San Antonio, Tex.	8	6	5
Port Arthur, Tex.	8.5	6	5

Continental Oil

Conoco Bronz-z-z (*Regular Grade*)

	†T.W.	Dealer	Gasoline Taxes	Kerosine ‡T.W.
Denver, Col.	8	..	5	10.5
Grand Junction, Col.	12.5	..	5	12.5
Pueblo, Col.	8	..	5	9
Casper, Wyo.	11.5	..	5	11.5
Cheyenne, Wyo.	9	..	5	11
Billings, Mont.	12	..	6	12
Butte, Mont.	10	..	6	13
Great Falls, Mont.	12	..	6	12
Helena, Mont.	12.5	..	6	12.5
Salt Lake City, Utah	10.5	10.5	5	14
Boise, Ida.	*15.1	*15.1	6	16
Twin Falls, Ida.	*15.1	*15.1	6	16.5
Albuquerque, N. M.	7	..	*6.5	10
Roswell, N. M.	9.5	9.5	*6.5	8
Santa Fe, N. M.	10.5	10.5	*7	10
Ft. Smith, Ark.	9.5	..	5	7.5
Little Rock, Ark.	9.25	..	7.5	8
Texarkana, Ark.	8	..	5	7
Muskogee, Okla.	7	..	5	7
Oklahoma City, Okla.	5	..	5	6.5
Tulsa, Okla.	6	..	5	6

Demand Gasoline (*Third Grade*)

Denver, Col.	6	..	5	....
Grand Junction, Col.	11.5	..	5	....
Pueblo, Col.	6	..	5	....
Casper, Wyo.	10.5	..	5	....
Cheyenne, Wyo.	8	..	5	....
Billings, Mont.	11	..	6	....
Butte, Mont.	9	..	6	....
Great Falls, Mont.	11	..	6	....
Helena, Mont.	11	..	6	....
Salt Lake City, Utah	9.5	9.5	5	....
Boise, Ida.	*14.1	*14.1	6	....
Twin Falls, Ida.	*14.1	*14.1	6	....
Albuquerque, N. M.	6	..	*6.5	....
Roswell, N. M.	8.5	8.5	*6.5	....
Santa Fe, N. M.	9.5	9.5	*7	....
Ft. Smith, Ark.	7	..	5	....
Little Rock, Ark.	7.5	..	7.5	....
Texarkana, Ark.	5	..	5	....
Muskogee, Okla.	6	..	5	....
Oklahoma City, Okla.	4.50	..	5	....
Tulsa, Okla.	5	..	5	....

Conoco Special Gasoline (Aviation)

	T.W. & Dealer Price	Gasoline Taxes
Denver, Colo.	15	5
Cheyenne, Wyo.	15.5	5
Helena, Mont.	22.5	6
Salt Lake City, Utah	18	5
Albuquerque, N. M.	14	*6.5

*Taxes: In gasoline tax column are included these city taxes—Albuquerque and Roswell, 0.5c; Santa Fe, 1c. Idaho prices include 0.1c to cover 1-mill tax for toll bridges.

†To consumers; also to dealers at points where no dealer prices are shown.

‡To consumers and dealers.

S. O. California

Standard Gasoline (*Regular Grade*)

	T.W.	S.S.	Gasoline Taxes	Kerosine T.W.
San Francisco, Cal.	13.5	14.5	4	11.5
Los Angeles, Cal.	13	14	4	10
Fresno, Cal.	14.5	15.5	4	12.5
Phoenix, Ariz.	14	15	6	*12.5
Reno, Nev.	15.5	16.5	5	13.5
Portland, Ore.	14	15	6	13.5
Seattle, Wash.	14	15	6	*13.5
Spokane, Wash.	15.5	16.5	6	*16.5
Tacoma, Wash.	14	15	6	*13.5

Flight Gasoline (*Third Grade*)

San Francisco, Cal.	12	13	4	....
Los Angeles, Cal.	11.5	12.5	4	....
Fresno, Cal.	13	14	4	....
Reno, Nev.	14	15	5	....
Phoenix, Ariz.	11	12	6	....
Portland, Ore.	12.5	13.5	6	....
Seattle, Wash.	12.5	13.5	6	....
Spokane, Wash.	13	14	6	....
Tacoma, Wash.	12.5	13.5	6	....

S. O. California (Cont'd)

Stanavo Aviation Gasoline

Phoenix, Ariz.	17.5	..	6	....
Los Angeles, Cal.	15	..	4	....
San Francisco, Cal.	15.5	..	4	....
Reno, Nev.	17.5	..	5	....
Portland, Ore.	16	..	6	....
Seattle, Wash.	16	..	6	....
Spokane, Wash.	19	..	6	....

*Taxes: Arizona kerosine prices are ex 5c state tax. Washington kerosine prices are ex 0.25c tax on sales.

Discounts:

To 100% dealers—3c off t.w. on Standard and Stanavo Aviation; 2c off t.w. on Flight.

Canada

PRICES OF IMPERIAL OIL LTD.

Per Imperial Gallon, which is 1.2 U. S. Gallons

3-Star Imperial Gasoline

	(*Regular Grade*) T.W.	Gasoline Taxes	Kerosine T.W.
Hamilton, Ont.	15.5	8	16
Toronto, Ont.	15.5	8	16
Brandon, Man.	21	7	22
Winnipeg, Man.	19.5	7	20.5
Regina, Sask.	18.5	7	20.5
Saskatoon, Sask.	21	7	23
Edmonton, Alta.	18.9	7	20.9
Calgary, Alta.	16	7	18
Vancouver, B. C.	16	7	23
Montreal, Que.	16	8	16.5
St. John, N. B.	15	10	19
Halifax, N. S.	15	10	19

Discounts: To undivided dealers, 1c off t.w. price, except Maritime Provinces where undivided dealers pay t.w. price. Divided dealers pay t.w. price thru territory.

Price Changes

Socony-Vacuum—Socony Mobilgas:

Plattsburg "split" dealer t. w. cut 1c, April 6.

Boston "split" dealer t. w. cut 0.5c, April 5.

Burlington "split" dealer t. w. up 1.4c, April 8.

Rutland "split" dealer t. w. up 1.8c, April 8.

Atlantic Refining—Atlantic White Flash Gasoline:

Boston dealer t. w. cut 0.5c, April 5.

Trenton dealer t. w. cut 1c, April 6.

S. O. Indiana—Red Crown:

Saginaw dealer price cut 0.6c, April 6.

Stanolind:

Saginaw dealer price cut 0.4c, April 6.

Continental Oil—Conoco Bronz-z-z:

Butte t. w. cut 2c, April 10.

Muskogee t. w. cut 1c, dealer dropped, March 27.

Oklahoma City t. w. cut 1c, dealer dropped, March 28.

Correction: Oklahoma City dealer price in April 10 issue of N.P.N. should have been 5c.

Continental Oil—Demand Gasoline:

Muskogee t. w. cut 1c, dealer dropped, March 27.

Oklahoma City t. w. cut 1c, dealer dropped, March 28.

Correction: Oklahoma City dealer price in April 10 issue of N.P.N. should have been 4.5c.

Butte t. w. cut 1.5c, April 10.

California

(*Continued from page* 46)

the cause for fractional advances reported in quotations on gas oil that brought the range of prices on that product to $1.00-$1.05 per bbl. at independent plants in the Los Angeles Basin.

Although several independent refineries in the Basin remained shutdown and others were reported running on a part-time schedule, highly competitive conditions in that district resulted in wide fluctuations in third grade gasoline prices. Quotations at Basin plants were said to range from 6c to 6.75c.

Gulf

NEW YORK, April 13.—Gasoline continued "quiet" and kerosine "tight" at the Gulf for all products with quotations generally unchanged, according to reports of refiners the past week. One refiner said he had withdrawn from the open spot market because "conditions are too unsettled."

An export inquiry for 2000 tons of "B" fuel was reported in the market, and a refiner reported selling 20,000 bbls. of 41-43 w.w. kerosine to another refiner for resale at 4.625c, but aside from this there were no indications of activity. Quotations reported for kerosine ranged from 4.50c to 4.625c.

A seller with storage at the Gulf said he was offering 70 oct. unleaded and 72-74 oct. leaded gasolines at 5c, No. 2 fuel at 4c and Bunker "C" in cargo lots at $0.75. Quotations reported for 70 oct. gasoline ranged from 5.875c to 6.25c, and for 72-74 oct. leaded from 5.25 to 6.25c.

Group 3 Freight Rates

To Division Headquarters Points of Standard Oil Co. of Indiana

	Gasoline-Kerosine		Distillate-Gas Oil-Fuel Oil	
	Cents per Cwt.	Cents per gal. 6.6 lbs.	Cents per Cwt.	Cents per gal. 7.4 lbs.
Chicago, Ill.	40	2.640	32	2.368
Decatur, Ill.	39	2.574	31	2.294
Joliet, Ill.	40	2.640	32	2.368
Peoria, Ill.	39	2.574	31	2.294
Quincy, Ill.	36	2.376	29	2.146
Indianapolis, Ind.	48	3.168	39	2.886
Evansville, Ind.	46	3.036	37	2.738
South Bend, Ind.	49	3.234	**42	**3.108
Detroit, Mich.	64	4.224	51	3.774
Gd. Rapids, Mich.	61	4.026	50	3.700
Saginaw, Mich.	66	4.356	53	3.922
Green Bay, Wis.	51	3.366	41	3.034
Milwaukee, Wis.	43	2.838	34.5	2.553
LaCrosse, Wis.	46	3.036	37	2.738
Min'ap'ls-St. Paul.	46	3.036	37	2.738
Duluth, Minn.	52	3.432	41.5	3.071
Mankato, Minn.	46	3.036	37	2.738
Des Moines, Ia.	36	2.376	29	2.146
Davenport, Ia.	39	2.574	31	2.294
Mason City, Ia.	42	2.772	33.5	2.479
St. Louis, Mo.	33	2.178	26.5	1.961
Kansas City, Mo.	28	1.848	22.5	1.665
St. Joseph, Mo.	28	1.848	22.5	1.665
Fargo, N. D.	63	4.158	50.5	3.737
Minot, N. D.	83	5.478	66.5	4.921
Huron, S. D.	53	3.498	42.5	3.145
Wichita				
From Ponca City	7.5	*0.495	7.5	†0.555
From Tulsa	12.5	*0.825	12.5	†0.925
From Cushing	11	*0.726	11	†0.814

*This rate also includes distillate rate at 6.6 lbs. per gal.

**This rate applies only to residual fuel and gas oil. Combination rate of 32c per cwt. at 7.4, Group 3 to Chicago, plus 9c per cwt. at 6.6, Chicago to South Bend, total of 2.962c per gal., applies to petroleum fuel oil distillate not suitable for illuminating purposes.

†This rate is exclusive of distillate which is based on 6.6 lbs. per gal. from Ponca City, Tulsa and Cushing, Okla., to Wichita. Includes only gas oil and fuel oil.

NOTE: There is no Group 3 rate to Wichita, Kans.

Coming Meetings

APRIL

Indiana Assn. of Inspectors of Weights & Measures, 27th Conference, Vendome Hotel, Evansville, Ind., April 22, 23 and 24.

American Institute of Mining & Metallurgical Engineers, Open Hearth Conference, Pittsburgh, Pa., April 24-26.

Pennsylvania State College, 9th Petroleum and Natural Gas Conference, State College, Pa., April 26-27.

MAY

Petroleum Industry Electrical Assn., Dallas, Tex., May 1 to 3.

American Society of Mechanical Engineers, Spring Meeting, Worcester, New York, Hotel Bancroft, May 1-3.

American Gas Ass'n., Natural Gas Section. Houston, Tex., May 6-10.

Society of Automotive Engineers, National Production Meeting, Hotel Bond, Hartford, Conn., May 7-8.

National Fire Protection Assn., 45th Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, New Jersey, May 7-11.

American Institute of Chemical Engineers 32nd Semi-Annual Meeting, Statler Hotel, Buffalo, N. Y., May 13, 14 and 15.

Natural Gasoline Assn. of America, 19th annual convention, Hotel Tulsa, Tulsa, May 15, 16, 17.

International Petroleum Exposition and Congress, Tulsa, May 18-25.

American Petroleum Institute, 10th Mid-Year Meeting, Blackstone & Texas Hotels, Fort Worth, Tex., May 27-31.

JUNE

National Oil Scouts' & Landmen's Assn., 17th Annual Convention, Arlington Hotel, Hot Springs National Park, Ark., May 30-June 1.

Illinois-Indiana Petroleum Assn., Eighth Annual Petroleum Conference, Robinson, Ill., June 1.

National Assn. of Purchasing Agents (Oil Company Buyers' Group) Annual Convention, Netherland-Plaza Hotel, Cincinnati, Ohio, June 3-6.

Oil Trades Ass'n. of New York, Sports Day. Pelham Country Club, Pelham, N. Y., June 11.

Society of Automotive Engineers, Summer Meeting, The Greenbrier, White Sulphur Springs, W. Va., June 9-14.

Southwest Petroleum Credit Group, San Antonio, Tex., June 17-20.

American Society of Mechanical Engineers, Milwaukee, Wis., June 17-20.

American Society for Testing Materials, Chalfonte-Haddon Hall, Atlantic City, N. J., June 24-28.

SEPTEMBER

American Society of Mechanical Engineers, Spokane, Wash., Sept. 3-5.

American Chemical Society, Detroit, Mich., Sept. 9-13.

Oil Trades Assn. of New York, Sports Day, Pelham Country Club, Pelham, N. Y., Sept. 17.

National Petroleum Assn., Hotel Traymore, Atlantic City, N. J., Sept. 18-20.

OCTOBER

National Lubricating Grease Institute, Annual Convention, Stevens Hotel, Chicago, Ill., Sept. 30, Oct. 1.

American Gas Assn., Atlantic City, New Jersey, Oct. 7-10.

National Safety Congress & Exposition, Hotel Stevens, Chicago, Ill., Oct. 7-11.

Automobile Manufacturers Assn., 1940 Auto-Show, New York, Oct. 12.

Independent Petroleum Assn. of America, Annual Meeting, Dallas, Texas, Oct. 16-18.

Oil Trades Assn. of New York, Annual Banquet, Waldorf-Astoria Hotel, New York, N. Y., Oct. 29.

NOVEMBER

Texas Mid-Continent Oil & Gas Assn., Fort Worth, Tex., Oct. 31-Nov. 2.

American Petroleum Institute, 21st Annual Meeting, Stevens Hotel, Chicago, Ill., Nov. 11-15.

DECEMBER

Exposition of Chemical Industries, Grand Central Palace, New York, N. Y., Dec. 1-6.

Retail Posted Gasoline Prices At Service Stations in 50 Cities

The following price information is obtained from reliable sources but is not guaranteed.

Prices reported in effect as of April 1, 1940

	Net Dealer Price	Indicated Dealer Margin	Total "Gas" Tax*	Apparent Previg. Posted Retail Price Incl. Tax
Portland, Me.	8.6	3.9	5.0	17.5
Manchester	9.0	3.0	5.0	17.0
Burlington, Vt.	8.0	3.0	5.0	16.0
Boston	8.0	3.0	4.0	15.0
Providence	8.5	2.5	4.0	15.0
Hartford	8.8	3.0	4.0	15.8
Buffalo	9.0	3.4	5.0	17.4
New York	8.3	3.7	5.0	17.0
Newark	8.1	3.8	4.0	15.9
Philadelphia	8.0	3.0	5.0	16.0
Dover, Del.	8.0	1.5	5.0	14.5
Baltimore	8.25	4.55	5.0	17.8
Washington	8.5	4.0	3.0	15.5
Charleston, W. Va.	10.55	4.05	6.0	20.6
Norfolk, Va.	9.75	4.55	6.0	20.3
Charlotte, N. C.	10.9	3.8	7.0	21.7
Charleston, S. C.	9.25	3.75	7.0	20.0
Atlanta	11.0	4.0	7.0	22.0
Jacksonville	9.0	3.0	8.0	20.0
Birmingham	10.5	4.0	8.0*	22.5
Vicksburg	9.0	5.5	7.0	21.5
Memphis	9.0	4.8	8.0	21.8
Lexington	10.5	3.5	6.0	20.0
Youngstown, O.	8.5	3.0	5.0	16.5
South Bend	10.3	4.2	5.0	19.5
Chicago	9.1	2.32	4.0	15.42
Detroit	8.1	3.2	4.0	15.3
Milwaukee	9.8	4.1	5.0	18.9
St. Paul-Minneapolis	9.5	4.0	5.0	18.5
Fargo, N. D.	11.2	3.5	5.0	19.7
Huron, S. D.	10.5	4.2	5.0	19.7
Omaha	7.5	3.0	6.0	16.5
Des Moines	8.4	3.5	4.0	15.9
St. Louis	9.2	3.5	4.0*	16.7
Wichita	7.1	2.8	4.0	13.9
Tulsa	6.0	4.0	5.0	15.0
Little Rock	9.25	4.25	7.5	21.0
New Orleans	8.75	4.0	8.0	20.75
Houston	8.5	4.0	5.0	17.5
Albuquerque	7.0	4.5	6.5**	18.0
Denver	8.0	4.0	5.0	17.0
Casper, Wyo.	11.0	5.0	5.0	21.0
Butte, Mont.	12.0	4.5	6.0	22.5
Boise, Idaho	15.0	4.0	6.1	25.1
Salt Lake City	10.5	4.5	5.0	20.0
Reno, Nev.	12.5	4.0	5.0	21.5
Phoenix, Ariz.	11.0	4.0	6.0	21.0
San Francisco	10.5	4.0	4.0	18.5
Portland	11.0	4.0	6.0	21.0
Spokane	12.5	4.0	6.0	22.5
†Average 50 Cities	9.42	3.75	5.42	18.59

*Includes 1c city tax. **Includes 0.5c city tax. †"Average 50 Cities" figures as published in the Dec. 20, 1939 issue of NPN at page 39 were incorrect. Correct figures are: 9.75; 3.76; 5.42 and 18.93 respectively.

CRUDE OIL MARKETS

Prices in $ per bbl. of 42 U. S. gals. at the well. A. P. I. gravity. Prices are effective as of 7 a. m. of dates as given

EASTERN FIELDS

Posted by Joseph Seep Purchasing Agency
(Effective Jan. 1, 1940, except Corning Nov. 4, 1939)

Bradford-Allegany (Penna. and N. Y.).....$2.75
Penna. Grade Oil in Southwest Penna. Pipe Lines.....$2.40
Penna. Grade Oil in Eureka Pipe Lines (West Virginia).....$2.34
Corning Oil in Buckeye Pipe Lines (Ohio)..$1.12

Posted by Other Companies

Tide Water Associated Oil Co.
Bradford-Allegany district (Penna. and N. Y.)
(Effective Jan. 1, 1940).....$2.75
*The Penuzoil Co.: (Effective Jan. 1, 1940)
Penna. Grade Oil in National Transit Lines*$2.68
*The Pennzoil Co. posts $2.68 in Cochran, Franklin, Hamilton and Doolittle, Pa. fields, prices in other lower districts range down to $2.63 per bbl. at well.

MICHIGAN

Posted by Pure Oil Co.
(Effective Oct. 9, 1939)

Midland, Midland County.....$1.02
Sherman.....$0.97
Clare-Freeman.....$0.97

Posted by Simrall Corp.
(Effective Oct. 9, 1939)

Crystal, Greendale, Porter, Vernon and Wise..$1.02
Beaverton, Buckeye, Bentley, Edenville.....$1.00
Freeman and Redding.....$0.97
Arenac.....$0.82
(Effective Nov. 1, 1939)
West Branch.....$0.85

Posted by Sohio Corp. (Michigan Division)
(Effective Oct. 9, 1939)

Allegan and Kent Counties.....$1.03
(Effective Nov. 9, 1939)
Van Buren County.....$1.03

Posted by Bay Pipe Line Corp.
(Effective Oct. 9, 1939)

Bentley and Buckeye.....$1.00
Saginaw and Wise..$1.02 Clare.....$0.76

CENTRAL STATES FIELDS

Posted by Ohio Oil Co.
(Effective June 8, 1939)

Illinois and Western Indiana.....$0.95
Illinois Basin.....$1.05

Posted by Sohio Corp.

Illinois Basin:
(Effective Oct. 21, 1939)
Salem (Lake Centralia).....$1.05
(Effective June 8, 1939)
Balance of Illinois Basin.....$1.05
(Effective Oct. 10, 1939)
Griffin (Ind.) pool, sand wells.....$0.95
Griffin (Ind.) pool, McCloskey lime.....$0.85

Posted by Carter Oil Co.
(Effective June 10, 1939)

Louden, Fayette County, Ill.....$1.05

Posted by Ashland Oil & Transportation Co.
(Effective June 9, 1939)

Somerset Oil in Ashland Lines, Kentucky:
Big Sandy River...$1.02 Kentucky River...$1.10

Western Kentucky

Posted by Sohio Corp.
(Effective June 9, 1939)

Birk City Area.....$0.90
Corydon Area (Henderson).....$0.90

Posted by Owensboro-Ashland Co.

Owensboro Area.....$1.00

CANADIAN FIELDS

Posted by Imperial Oil Limited
Western Ontario
(Effective Nov. 6, 1939)

Petrolia.....$2.10 Oil Springs.....$2.17

Alberta Turner Valley
(Prices f.o.b. field tankage)
(Effective Jan. 5, 1938)

Crude Oil			
40-40.9°	$1.14	53-53.9	$1.40
41-41.9	1.16	54-54.9	1.42
42-42.9	1.18	55-55.9	1.44
43-43.9	1.20	56-56.9	1.46
44-44.9	1.22	57-57.9	1.48
45-45.9	1.24	58-58.9	1.50
46-46.9	1.26	59-59.9	1.52
47-47.9	1.28	60-60.9	1.54
48-48.9	1.30	61-61.9	1.56
49-49.9	1.32	62-62.9	1.58
50-50.9	1.34	63-63.9	1.60
51-51.9	1.36	64-64.9	1.62
52-52.9	1.38		

Crude Naphtha, 65 grav. & above.....$2.14
Absorption Gasoline
90% Rec., 20 lb. Reid v.p.....$1.94
90% Rec., 17 lb. Reid v.p.....$2.08

MID-CONTINENT—Oklahoma-Kansas

*(For effective dates, see footnote)

	S. O. Indiana	Carter Mag-nolia Shell	Conti-nental Texas Co.	Sin-clair Prairie
Below 21°	$0.70	$0.60	....	....
21-21.9	.72	.63	....	....
22-22.9	.74	.66	....	....
23-23.9	.76	.69	....	....
24-24.9	.78	.72	....	....
25-25.9	.80	.75	....	$0.58
26-26.9	.82	.78	....	.63
27-27.9	.84	.81	....	.68
28-28.9	.86	.84	$0.86	.73
29-29.9	.88	.87	.88	.78
30-30.9	.90	.90	.90	.82
31-31.9	.92	.92	.92	.86
32-32.9	.94	.94	.94	.90
33-33.9	.96	.96	.96	.96
34-34.9	.98	.98	.98	.98
35-35.9	1.00	1.00	1.00	1.00
36-36.9	1.02	1.02	1.02	1.02
37-37.9	1.04	1.04	1.04	1.04
38-38.9	1.06	1.06	1.06	1.06
39-39.9	1.08	1.08	1.08	1.08
40 & above	1.10	1.10	1.10	1.10

*Effective in 1938 by Carter Oil, Oct. 13, posting in Okla. only: Continental Oil, Oct. 11, with lowest grade below 29; Magnolia, Oct. 12, posting in Okla. only; Shell, Oct. 22; S. O. Indiana, Oct. 17; The Texas Co., Oct. 12. Aug. 31, 1939, by Sinclair-Prairie.

North-North Central and Central Texas
*(For effective dates, see footnote)

	Stano-lind	Sinclair Texas Co. Conti-nental Magnolia
Below 21°	$0.60	....
21-21.9	.62	....
22-22.9	.64	....
23-23.9	.66	....
24-24.9	.68	$0.79
25-25.9	.70	for
26-26.9	.72	oil
27-27.9	.74	below
28-28.9	.76	29°.
29-29.9	.78	.81
30-30.9	.80	.83
31-31.9	.82	.85
32-32.9	.84	.87
33-33.9	.86	.89
34-34.9	.88	.91
35-35.9	.90	.93
36-36.9	.92	.95
37-37.9	.94	.97
38-38.9	.96	.99
39-39.9	.98	1.01
40 & above	1.00	1.03

*Effective Oct. 11, 1938 by Continental, in North Tex.; Oct. 12, 1938, by Texas Co. in North & North Central Texas. Texas Co.'s lowest grade is 28-28.9, at $0.79; by Magnolia, Dec. 3, 1938, in N. and N. Central Texas; Oct. 5, 1939 by Sinclair Prairie in Mexia and N. Cent. Texas.

Jefferson County, Texas—Beaumont

(Posted by Magnolia Petroleum Co., Effective Oct. 2, 1939, and by Stanolind Oil & Gas Co., for West Beaumont, Effective Oct. 2, 1939)

Below 20°	$0.86	30-30.9	$1.08
20-20.9	.88	31-31.9	1.10
21-21.9	.90	32-32.9	1.12
22-22.9	.92	33-33.9	1.14
23-23.9	.94	34-34.9	1.16
24-24.9	.96	35-35.9	1.18
25-25.9	.98	36-36.9	1.20
26-26.9	1.00	37-37.9	1.22
27-27.9	1.02	38-38.9	1.24
28-28.9	1.04	39-39.9	1.26
29-29.9	1.06	40 & above	1.28

TEXAS FIELDS

Posted by Humble Oil & Refining Co.
West Central Texas
(Effective Aug. 11, 1939)

24-24.9	$0.71	33-33.9	$0.89
25-25.9	.73	34-34.9	.91
26-26.9	.75	35-35.9	.93
27-27.9	.77	36-36.9	.95
28-28.9	.79	37-37.9	.97
29-29.9	.81	38-38.9	.99
30-30.9	.83	39-39.9	1.01
31-31.9	.85	40 & above	1.03
32-32.9	.87		

*Includes Brown, Callahan, Coleman, Comanche, Eastland, Fisher, Haskell, Jones, Shackelford, Stephens, Throckmorton and Young Counties.

Effective Aug. 29, 1939, Shell posted in Fisher county, Tex., prices 3c lower than Humble's West Central Texas prices; Shell's schedule begins with below 25, at $0.68 and ends with 40 & above, at $1.

Note: Effective Oct. 1, 1937, Humble prices are based on 100% tank tables at 60F.

East Central Texas
(Effective Aug. 11, 1939)

23-23.9	$0.78	32-32.9	$0.96
24-24.9	.80	33-33.9	.98
25-25.9	.82	34-34.9	1.00
26-26.9	.84	35-35.9	1.02
27-27.9	.86	36-36.9	1.04
28-28.9	.88	37-37.9	1.06
29-29.9	.90	38-38.9	1.08
30-30.9	.92	39-39.9	1.10
31-31.9	.94	40 and above	1.12

Posted by Pan American Pipe Line Co.
(Effective Oct. 2, 1939)

Cayuga, Anderson county.....$0.78
*Including Anderson, Cherokee, Limestone, Navarro counties.

PANHANDLE TEXAS

	Humble (Aug. 11, 1939)		Texas Co. (Oct. 2, 1939)	
	Gray County	Carson Hutchinson	Sweet	Sour
28-28.9	$0.72	$0.67	....	....
29-29.9	.74	.69	....	....
30-30.9	.76	.71	....	....
31-31.9	.78	.73	....	....
32-32.9	.80	.75	....	....
33-33.9	.82	.77	....	....
34-34.9	.84	.79	$0.84	$0.79
35-35.9	.86	.81	.86	.81
36-36.9	.88	.83	.88	.83
37-37.9	.90	.85	.90	.85
38-38.9	.92	.87	.92	.87
39-39.9	.94	.89	.94	.89
40 & above	.96	.91	.96	.91

Effective Aug. 31, 1939, Sinclair Prairie met Humble in Panhandle Texas. Dec. 3, 1938, Magnolia posted same schedule as Humble.

*EAST TEXAS

By Humble, Shell, Sinclair-Prairie, Stanolind, Gulf, Magnolia, Texas Co., Tide Water-Associated $1.10

*Effective dates: Aug. 11, 1939, by Humble and Tide Water-Associated; Aug. 29, 1939, by Stanolind; Oct. 2, 1939 by Sinclair Prairie; Oct. 5, 1939 by Shell; Oct. 12, 1938, by Magnolia, Texas Co.; Oct. 13, 1938, by Gulf.

*Includes Cherokee, Gregg, Rusk, Smith and Upshur counties.

Posted by Shell Oil Co., Inc.
(Effective Oct. 5, 1939)

Polk County, Tex. (Livingston and Schwab-Wilcox areas).....$1.10

NORTHEAST TEXAS

(Posted by Humble, Oct. 2, 1939)

Talco.....$0.65

(Posted by Magnolia, Oct. 12, 1938)

Cass County and Panola County, Tex.:
Magnolia posts below 25° at $0.73, plus 2c differential for each degree, to top grade of 40 & above, at $1.05.

(Posted by The Texas Co., Oct. 12, 1938)

Cass County.....$1.05

WEST TEXAS and NEW MEXICO

(a) (For effective dates, see footnote)

	Humble	Stano-lind	Shell	Texas Co. Sinclair (c)
Below 20°	$0.53	....	$0.53	....
20-20.9	.55	....	.55	....
21-21.9	.57	....	.57	....
22-22.9	.59	$0.67	.59	....
23-23.9	.61	for	.61	....
24-24.9	.63	oil	.63	....
25-25.9	.65	Below	.65	$0.65
26-26.9	.67	26°.	.67	.67
27-27.9	.69	.69	.69	.69
28-28.9	.71	.71	.71	.71
29-29.9	.73	.73	.73	.73
30-30.9	.75	.75	.75	.75
31-31.9	.77	.77	.77	.77
32-32.9	.79	.79	.79	.79
33-33.9	.81	.81	.81	.81
34-34.9	.83	.83	.83	.83
35-35.9	.85	.85	.85	.85
36-36.9	.87	.87	.87	.87
37-37.9	.89	.89	for	for
38-38.9	.91	.91	oil	oil
39-39.9	.93	.93	36° &	36° &
40 & above	.95	.95	above.	above.

Posted by Magnolia Petroleum Co.
(Effective Oct. 12, 1938 in West Texas; Oct. 15, 1939 in Lea County, N. Mex.)

	West Texas	N. Mex.		West Texas	N. Mex.
Below 25.	$0.63	$0.63	33-33.9	$0.81	$0.81
25-25.9	.65	.65	34-34.9	.83	.83
26-26.9	.67	.67	35-35.9	.85	.85
27-27.9	.69	.69	36-36.9	.87	.87
28-28.9	.71	.71	37-37.9	.89	for
29-29.9	.73	.73	38-38.9	.91	oil
30-30.9	.75	.75	39-39.9	.93	36 &
31-31.9	.77	.77	40 & over.	.95	above
32-32.9	.79	.79			

Note: Magnolia's West Texas postings are in Crane, Glasscock, Howard, Mitchell, Upton and Winkler counties.

Pecos County, West Texas
(Posted by Humble Aug. 11, 1939 and Shell, Aug. 29 '39)

Pecos.....$0.78
Yates Shallow Pool (Shell only).....65

Posted by Sinclair Prairie Oil Marketing Co.
(Effective Aug. 31, 1939)

Eddy county, N. Mex.....$0.77

(a) Effective Aug. 11, 1939 by Humble; Shell Oil, Aug. 29, 1939; by The Texas Co., Oct. 12, 1938; Stanolind, Aug. 29, 1939; Sinclair Prairie, Aug. 31, 1939.
(c) Texas Co. posts $0.65 for below 26; Sinclair Prairie, $0.63 for below 25.
Note: Humble's postings are in these counties: Andrews, Crane, Crockett, Ector, Gaines, Glasscock, Howard, Reagan, Upton, Winkler and Yoakum, West Texas; and Lea county, N. Mex.; Shell, in Crane, Ector, Glasscock, Howard, Upton, Winkler, Yoakum, Lea; Stanolind in Hendrick and Henderson field, Winkler county; Texas Co. in Ward, Winkler and Lea.

Posted by Continental Oil Co.
(Effective Oct. 11, 1938)

Artesia, Jackson and Maljamar pools, New Mexico; gravity schedule beginning with below 29, at $0.61; 29-29.9, at $0.63; plus 2c differential for each gravity, up to 40 & above, at $0.85.

COLORADO

Posted by Continental Oil Co.
(Effective Oct. 11, 1938)
Ft. Collins and Wellington

Below 29	$0.81	35-35.9	$0.95
29-29.9	.83	36-36.9	.97
30-30.9	.85	37-37.9	.99
31-31.9	.87	38-38.9	1.01
32-32.9	.89	39-39.9	1.03
33-33.9	.91	40 & above	1.05
34-34.9	.93		

Canon City and Florence, Col.....$0.90

SOUTH AND SOUTHWEST TEXAS

All Shown Below Posted by Humble Oil & Refining Co.
(Effective Aug. 11, 1939)

Carroll, Clark, Darst Creek, Hilbig, Salt Flat and Zoboroski crudes.....$0.96
Van crude.....$0.93
Conroe.....$1.27

(Effective Oct. 2, 1939)
Flour Bluff and Jim Wells County.....$1.23
(Effective Sept. 14, 1939)
Hardin, Liberty county.....$1.10

Oct. 12, '38, Magnolia posted $0.96 in Darst Creek; $0.87 in Luling; $0.99 in Lytton Springs; $1.14 for Cleveland, and $1.02 in Hardin, both in Liberty county, Tex.

Oct. 12, '38, The Texas Co. posted $0.96 in Darst Creek.

(Continued on next page)

CRUDE OIL MARKETS *(Continued from preceding page)*

***Anahuac-Dickinson**
(Effective Oct. 2, 1939)

Below 20°	$0.81	30-30.9	$1.03
20-20.9	.83	31-31.9	1.05
21-21.9	.85	32-32.9	1.07
22-22.9	.87	33-33.9	1.09
23-23.9	.89	34-34.9	1.11
24-24.9	.91	35-35.9	1.13
25-25.9	.93	36-36.9	1.15
26-26.9	.95	37-37.9	1.17
27-27.9	.97	38-38.9	1.19
28-28.9	.99	39-39.9	1.21
29-29.9	1.01	40 & above	1.23

*Anahuac-Dickinson includes Cedar Point, Fairbanks, Gillock, Hull, Pierce Junction and Raccoon Bend (shallow sand) and Turtle Bay.

Raccoon Bend (Deep sand crude) Tomball and Satsuma
(Effective Aug. 11, 1939)

22-22.9	$0.95	32-32.9	$1.15
23-23.9	.97	33-33.9	1.17
24-24.9	.99	34-34.9	1.19
25-25.9	1.01	35-35.9	1.21
26-26.9	1.03	36-36.9	1.23
27-27.9	1.05	37-37.9	1.25
28-28.9	1.07	38-38.9	1.27
29-29.9	1.09	39-39.9	1.29
30-30.9	1.11	40 & above	1.31
31-31.9	1.13		

Dec. 3, 1938, Magnolia posted above price and gravity schedule in Tomball. Effective Aug. 29, 1939, Stanolind met Humble in Tomball, except that Stanolind's schedule begins with below 29 at $1.07.

LOUISIANA-ARKANSAS

Posted by Standard Oil Co. of Louisiana
(†) (For effective dates, see footnote)

Gravity	*N. La. Ark. Sweet	Bunkie Eola, La.	*South La. Sour	*Ark. Sour	Baton Rouge-University
Below 20°	....	....	....	....	$0.79
20-20.9	$0.73	$0.83	‡$0.74	$0.63	.82
21-21.9	for	for	.77	for	.85
22-22.9	oil	oil	.80	oil	.88
23-23.9	Below	Below	.83	Below	.91
24-24.9	25°.	25°.	.86	25°.	.94
25-25.9	.75	.85	.89	.65	.97
26-26.9	.77	.87	.92	.67	1.00
27-27.9	.79	.89	.94	.69	1.02
28-28.9	.81	.91	.96	.71	1.04
29-29.9	.83	.93	.98	.73	1.06
30-30.9	.85	.95	1.00	.75	1.08
31-31.9	.87	.97	1.02	.77	1.10
32-32.9	.89	.99	1.04	.79	1.12
33-33.9	.91	1.01	1.06	.81	1.14
34-34.9	.93	1.03	1.08	.83	1.16
35-35.9	.95	1.05	1.10	.85	1.18
36-36.9	.97	1.07	1.12	.87	1.20
37-37.9	.99	1.09	1.14	.89	1.22
38-38.9	1.01	1.11	1.16	.91	1.24
39-39.9	1.03	1.13	1.18	.93	1.26
40 & above	1.05	1.15	1.20	.95	1.28

(Effective Aug. 30, 1939)

Smackover, Ark.	$0.73
Cotton Valley Distillate	$1.20

*N. La.-Ark. Sweet includes Caddo, Cotton Valley, Cross Lake, De Soto, Haynesville, Homer, Rodessa, Sabine and Sligo, La. crudes, and Miller county, Ark. S. La. Sour includes Choctaw, Darrow, N. Crowley, Roanoke and St. Martinsville. S. Ark. Sour includes Buchner, Magnolia and Village pools.

†N. La.-Ark. Sweet crude and S. La. Sour effective Aug. 30, 1939, except Cross Lake, La., Sept. 7, Baton Rouge-Univ., Sept. 11, and Bunkie and Eola, Oct. 23, 1939; and Ark. Sour, Sept. 13, 1939.

‡For Below 21°.

Effective Sept. 8, 1939, Gulf Refg. Co. met S. O. La's. N. La.-Ark. Sweet prices in Bull Bayou, Caddo, Crichton, De Soto, Haynesville, Homer, and El Dorado.

Posted by Arkansas Fuel Oil Corp.
(Effective Jan. 23, 1937)

Urania, La.	$1.02

Posted by Continental Oil Co.
(Effective Oct. 11, 1938)

Tepetate and Ville Platte, La.	$1.03

(Effective Jan. 1, 1939)
Abbeville, La.

Below 36	$0.92	38-38.9	$0.98
36-36.9	.94	39-39.9	1.00
37-37.9	.96	40 & above	1.02

Posted by Caddo Crude Oil Purchasing Corp.
(Effective Aug. 14, 1939)

Allison area, Shreveport field	$0.95

Lisbon, N. La.
(Effective Sept. 14, 1939)

27-27.9	$0.66	32-32.9	$0.76
28-28.9	.68	33-33.9	.78
29-29.9	.70	34-34.9	.80
30-30.9	.72	35 & above	.82
31-31.9	.74		

Lisbon prices met by Gulf, Sept. 14.

Note: S. O. Louisiana prices in all La.-Ark. fields, effective Oct. 5, 1938, are on 100% tank table basis.

GULF COASTAL FIELDS
(a) (For effective dates, see footnote)

Gravity	Continental Humble Sinclair Stanolind	Refugio Crude (Humble, Continental)	Texas Co.	Shell
Below 20	$0.86	$0.91	$0.86	(b)$0.79
20-20.9	.88	.93	.88	.81
21-21.9	.90	.95	.90	.83
22-22.9	.92	.97	.92	.86
23-23.9	.94	.99	.94	.89
24-24.9	.96	1.01	.96	.92
25-25.9	.98	1.03	.98	.95
26-26.9	1.00	1.05	1.00	.98
27-27.9	1.02	1.07	1.02	1.00
28-28.9	1.04	1.09	1.04	1.02
29-29.9	1.06	1.11	1.06	1.04
30-30.9	1.08	1.13	1.08	1.06
31-31.9	1.10	1.15	1.10	1.08
32-32.9	1.12	1.17	1.12	1.10
33-33.9	1.14	1.19	1.14	1.12
34-34.9	1.16	1.21	1.16	1.14

(Continued in next column)

35-35.9	1.18	1.23	for	for
36-36.9	1.20	1.25	oil	oil
37-37.9	1.22	1.27	31° &	34° &
38-38.9	1.24	1.29	above.	above.
39-39.9	1.26	1.31		
40 & above	1.28	1.33		

(a) Effective Oct. 2, 1939 by Continental, Humble and Texas Co.; Oct. 3, 1939 by Sinclair and Stanolind; Aug. 29, 1939 by Shell. Stanolind's lowest grade is below 21, at $0.88. Refugio, effective Oct. 2, '39 by Humble.

(b) Shell posts these prices in Iowa district, Black Bayou and White Castle, La.; prices in Iowa district have 2 lower grades: below 18, at $0.75, 18-18.9, $0.77; and 19-19.9, is $0.79.

Note: Humble's Gulf Coast prices apply in these Texas fields: Amelia, Clear Lake, Goose Creek, Mirando which includes Duval, Jim Hogg, Webb and Zapata counties and Heyser and Placedo fields; Mykawa, Sugarland, Thompsons and Webster.

Humble's prices in Refugio include crudes purchased in Saxet, East White Point, Greta, O'Connor-McFadden, Taft, Plymouth and Tom O'Connor fields.

Stanolind's prices apply in High Island and Spindletop; also in Clinton, Hastings and South Houston, where, effective Jan. 1, 1940, lowest grade is below 21° at $0.88; rest of schedule same as other Gulf Coast. Magnolia posts Mirando, effective Oct. 2, same prices as Humble. Texas Co.'s prices are in Texas and La., Gulf Coast; its prices on Refugio are same as Humble's up to 28 gravity; 28 & above, $1.09; on Duval-Mirando same as Humble's up to 28; 28 & above, $1.04; it posts Golden Meadow, La., 24-30 grav., $0.90, plus 2c differential, to 40 & above, $1.10.

Posted by Shell Oil Co., Inc.
(Effective Aug. 29, 1939)

Gibson field, Terreborne Parish, La.	$1.04

ROCKY MOUNTAIN FIELDS

Posted by Stanolind Oil & Gas Co.
(Effective Oct. 11, 1938)

Salt Creek, (except Tensleep crude), Midway and Dutton Creek, Wyo., same schedule as Stanolind posts in Oklahoma-Kansas, ranging from $0.86 to $1.10, which see under Mid-Continent crude on previous page.

Tensleep, Salt Creek field	$0.646
Iles, heavy	0.92
Elk Basin, light	0.90
Grass Creek, light	0.90
Frannie light	0.55
Grass Creek, heavy	0.40
Hamilton Dome, Wyo.	0.35
Frannie heavy	0.42

Posted by Ohio Oil Co.
(Effective Oct. 11, 1938)

Elk Basin, Wyo.	$0.90	Rock Creek	1.00
Grass Creek, light	0.90	Lance Creek	0.77
Dry Creek, Mont.			0.92

(Effective May 1, 1938)

Grass Creek, heavy	$0.50

(Effective Nov. 16, 1937)

Sunburst, Mont.	$0.90

Posted by Continental Oil Co.
(Effective Oct. 11, 1938)

Cat Creek, Mont.	$1.10
Big Muddy, Wyo.	0.98
Lance Creek, Wyo.	0.77

CALIFORNIA, *Posted by Standard Oil of California*

All gravities above those quoted take highest price offered in the field. Prices effective Feb. 1, 1940

Gravity	Signal Hill (Long Beach) and others*	Seal Beach	Huntington Beach	Inglewood	Playa Del Rey	Olinda Brea Canon	Athens-Rosecrans	Torrance	Richfield	Whittier East Coyote (La Habra)	Montebello	West Coyote Hills	Santa Fe Springs	Greeley Canal	Coles Levee Richfield Western	Mountain View and others**	Elk Hills	Buena Vista Hills, Midway-Sunset, Lakeview Area	Lost Hills	Coalinga	Wheeler Ridge	Santa Maria Val. (Union Oil, Sept. 1 '39)
14-14.9	$0.65	$0.64	$0.63	$0.64	$0.65	$0.61	....	$0.65	$0.61	$0.61	$0.62	$0.63	....	....	....	$0.60	$0.60	$0.60	$0.60	$0.60	....	$0.42
15-15.9	.65	.64	.63	.64	.65	.61	....	.65	.61	.61	.62	.63	....	....	....	.60	.60	.60	.60	.60	....	.44
16-16.9	.65	.64	.63	.64	.65	.61	....	.65	.61	.61	.62	.63	....	....	....	.60	.60	.60	.60	.60	....	.45
17-17.9	.65	.64	.63	.68	.65	.61	....	.65	.61	.61	.62	.63	....	....	....	.60	.60	.60	.60	.60	....	.46
18-18.9	.65	.64	.63	.71	.65	.65	....	.68	.61	.61	.62	.63	....	....	....	.60	.60	.60	.60	.60	....	
19-19.9	.69	.64	.67	.75	.70	.69	....	.72	.61	.65	.62	.63	....	....	....	.60	.64	.64	.64	.61	$0.60	
20-20.9	.73	.64	.72	.79	.76	.74	....	.75	.65	.69	.62	.67	....	....	....	.60	.69	.69	.69	.62	.60	
21-21.9	.78	.64	.76	.82	.81	.78	....	.79	.69	.73	.62	.72	$0.63	....	....	.64	.74	.74	.74	.66	.60	
22-22.9	.82	.69	.81	.86	.86	.82	....	.82	.73	.77	.66	.76	.63	....	....	.68	.79	.79	.78	.70	.63	
23-23.9	.86	.75	.85	.89	.92	.86	$0.71	.86	.78	.82	.71	.81	.67	....	....	.71	.84	.84	.82	.74	.67	
24-24.9	.90	.80	.90	.93	.97	.90	.77	.89	.82	.86	.75	.85	.72	....	....	.75	.89	.89	.86	.78	.71	
25-25.9	.95	.86	.94	.96	1.02	.95	.82	.93	.86	.90	.80	.89	.77	....	....	.79	.94	.94	.90	.82	.75	
26-26.9	.99	.91	.99	1.00	1.08	.99	.88	.96	.90	.94	.84	.94	.82	....	....	.83	.99	.99	.95	....	....	
27-27.9	1.03	.97	1.03	1.04	....	1.03	.94	1.00	.94	.98	.89	.98	.87	$0.83	$0.92	.87	1.04	1.04	.99	....	....	
28-28.9	1.07	1.02	1.07	1.07	....	1.07	.99	1.03	.98	....	.93	1.02	.91	.86	.96	.91	1.09	1.09	1.03	....	....	
29-29.9	1.10	1.07	1.11	1.10	....	1.10	1.04	1.06	1.02	....	.98	1.06	.96	.90	.99	.95	1.14	1.14	1.07	....	....	
30-30.9	1.14	1.12	1.15	1.14	....	1.14	1.09	1.09			1.02	1.10	1.01	.94	1.02	.99	1.19	1.19	1.11	....	....	
31-31.9	....	....	....	1.17		1.17	1.14	Elwood Terrace			1.07	1.14	1.05	.98	1.06	1.02	1.24	1.24	Kettleman Hills		....	
32-32.9	....	....	....	1.20		1.20	1.19	F. o. b. ship.			1.11	1.18	1.09	1.02	1.09	1.06	1.29	1.29			....	
33-33.9	....	....	....	....		....	1.24	$1.21	....	....	1.15	1.22	1.14	1.06	1.13	1.10	1.34	1.34	....	$1.12	....	
34-34.9	....	....	....	....		....	1.29	....	1.25	....	1.20	1.26	1.19	1.10	1.16	1.14	....	....	....	1.17	....	
35-35.9	....	....	....	....		....	1.34	....	1.29	....	1.24	....	1.23	1.14	1.20	....	....	....	....	1.21	....	
36-36.9	....	....	....	....		....	1.39	....	1.33	....	1.28	....	1.27	1.18	1.23	....	....	....	....	1.25	....	
37-37.9	....	....	....	....		....	1.44	....	1.37	....	1.33	....	1.31	1.22	1.26	....	....	....	....	1.29	....	
38-38.9	....	....	....	....		....	1.49	....	....	....	1.37	....	1.36	1.25	1.30	....	....	....	....	1.33	....	
39-39.9	....	....	....	....		....	1.54	....	....	....	1.42	....	....	1.29	1.34	....	....	....	....	1.38	....	
40-40.9	....	....	....	....		....	1.59	....	....	....	1.46	....	....	1.33	1.37	....	....	....	....	....	....	
41-41.9	....	....	....	....		....	....	....	....	....	1.50	....	....	1.37	1.40	....	....	....	....	....	....	
42-42.9	....	....	....	....		....	....	....	....	....	1.54	....	....	1.41	1.44	....	....	....	....	....	....	
43-43.9	....	....	....	....		....	....	....	....	....	1.59	....	....	1.45	1.47	....	....	....	....	....	....	
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45-45.9	....	....	....	....		....	....	....	....	....	1.67	....	....	1.53	1.54	....	....	....	....	....	....	
46-46.9	....	....	....	....		....	....	....	....	....	1.71	....	....	1.57	1.57	....	....	....	....	....	....	
47-47.9	....	....	....	....		....	....	....	....	....	....	....	....	1.61	....	....	....	....	....	....	....	
48-48.9	....	....	....	....		....	....	....	....	....	....	....	....	1.64	....	....	....	....	....	....	....	

FOB Standard Pipeline

*El Segundo prices same as Signal Hill. Wilmington prices same as Signal Hill, except below 19 gravity prices are: 14-16.9, $0.60; 17-17.9, $0.62; 18-18.9, $0.64.
**Includes Newhall, McKittrick, Kern River, Round Mountain and Kern Front, schedule for which ends with 19-19.9. Mountain View schedule begins with 19-19.9.

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Benjamin Electric Co.
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Brodie Co., Inc., Ralph N.
Buckeye Iron & Brass Works
Butler Manufacturing Co.

Champion Spark Plug Co.
Champlin Refining Co. 4
Chevrolet Motor Division, General Motors Sales Corp.
Chicago Bridge & Iron Co.
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Crown Can Co.
Curtis Pneumatic Machinery Co.

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Farrell Mfg. Co.
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Stewart-Warner Corp.
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Tokheim Oil Tank Co. First Cover
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Viking Pump Co.

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Refinery superintendent, assistant supt., engineer. Capable and experienced in the operation, maintenance and construction of all refining operations. Technically trained. Excellent management and efficient operation record. Box No. 208.

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Experienced refinery superintendent desires connection. Best references furnished. Box 305.

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For sale—1900-gallon single compartment four wheel Fruehauf gasoline transports good condition less tires $350.00 each. 4200-gallon Butler Transport $1,200.00. 2500-gallon two compartment Butler transport $1,000.00. 3300-gallon three compartment Butler Transport $1,200.00. G. E. Bobbitt, Box 1055, Raleigh, N. C.

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Formerly Old Guard Refining Co.'s plant at Philadelphia. Suitable for refining any kind of crude, crank-case, lubricating distillates, etc. Modern buildings, 3 acres land, near local plants of Gulf, Standard of Pa., and Atlantic Refining. Full equipment including tanks with heating coils connected by compressed air and steam lines, total capacity about 209,000 gals. Presses, many steam and electric pumps, air compressors, oil coolers, 2 Scotch Marine boilers, complete laboratory, still, sectional dephlegmator and condenser, etc.

The entire plant is in fine condition, entirely enclosed by Cyclone iron fence, and offered for sale at a very moderate price.

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Engineer who is familiar with refining equipment and processing. One who can make accurate studies of refining operations and be able to make concise, clear reports for executives. Age about 35. In applying please state education, experience, salary. This advertisement is known to our employes.

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"STRICTLY PERSONAL"

Adolph Hitler's latest blitzkrieg, caught **Dan W. Armstrong,** vice-president of Eastern States Petroleum Co., in Oslo, Norway, and **"Dick" Kahle,** president, hadn't been able to get in touch with him up to the end of last week.

* * *

George W. Hoffmayer, secretary of Indiana Independent Petroleum Assn., was confined to his bed last week on account of an infected tooth.

* * *

Those of us who dream of traveling to far-off lands, exploring jungle trails and rivers, envy **Donaldson B. Thorburn,** New York, who is resigning May 1 as Shell Oil Co.'s assistant sales promotion and advertising manager for an extended trip through Central and South America covering motion picture and writing assignments. Accompanying him will be his wife, Lois Long, also a writer and head of fashion department of *The New Yorker* magazine. The couple's itinerary includes Panama, Ecuador and Peru, after which they will journey down the Amazon river to Belem, returning to New York in the fall.

* * *

Floyd C. (Tom) Forester, independent oil marketer at North Wilkesboro, N. C., is running for the Democratic nomination to represent the 24th district (Wilkes, Yadkin and Davie counties) in the North Carolina state senate. Mr. Forester has been active in Democratic politics for 30 years and was a delegate to the Democratic national convention in Chicago where Franklin D. Roosevelt was nominated for his first term in 1932.

* * *

J. Howard Pew, Sun Oil Co. president, was a speaker at the industrial leadership conference April 9 in Richmond, Va., sponsored by the Virginia Manufacturers Assn. and the National Assn. of Manufacturers. Mr. Pew is national vice-president of the N.A.M.

* * *

C. R. Dooley, New York, industrial relations manager for Socony-Vacuum Oil Co., will speak at the Spring meeting of the American Society of Mechanical Engineers in Worcester, Mass., May 1, on "Merit Rating of Employes".

D. W. Elliott

D. W. (Walt) Elliott, Long Beach, has been elected president of the California Stripper Well Assn. He succeeds **Wilbur Harrison,** Apex Petroleum Corp., who served as head of the group for the past year. Mr. Elliott operates in the Long Beach and Wilmington fields and also has holdings in San Joaquin Valley. During 1939, Mr. Elliott was chairman of the Los Angeles Basin chapter of the American Petroleum Institute's production division. He is a member of the Pacific Coast Club, the Los Angeles Athletic Club and the California Yacht Club.

A new vice president of the California association was elected for the coming year—**Robert Davis,** Davis Investment Co.

Re-elected officers are: **A. D. Mitchell,** vice president; **Neal Elder,** of Morton and Elder, vice president; Robert I. Plomert, of A. N. Macrate Co., secretary-treasurer; and **Richard Fenton,** executive vice president.

* * *

Arthur R. Carmody, Shreveport, La., has been elected president of North Central Texas Oil Co., filling the vacancy caused by recent death of **William D. Bloodgood. Edwin L. Norton** was re-elected treasurer; **Francis B. Thorne,** vice president.

* * *

William J. Devaney, engineer for the Cities Service Oil Co., has been transferred from Ponca City, to the company's headquarters at Bartlesville.

Charles J. M. van Bergen has joined export department of Alliance Oil Corp., **L. C. Quackenbush,** president, announces. Mr. van Bergen was born in Sumatra and educated at Cambridge University where he majored in geology and chemistry. Prior to his going with Alliance on April 1, he was connected with Gulf Oil Corp.'s export division. While in Europe he worked out Gulf's Antwerp office.

* * *

Chester H. Westfall of Ponca City, Okla., at one time an executive with the old Marland Oil Co., has purchased an interest in the Claude Drilling Co. of Tulsa and has been elected president and general manager. He will move his family to Tulsa and continue the company's headquarters in that city.

* * *

E. T. "Gate" Gattrell of Tulsa was awarded a 35-year service pin at the Gulf Oil Corp.'s dinner honoring veteran employes in the Tulsa division recently. Mr. Gattrell had 36 years service to his credit when he retired a year ago. At the time of retirement he was general superintendent of pipelines for the Tulsa division. Oldest woman in point of service was **Mrs. Etta Willims** of Tulsa who had 30 years active service before her retirement a few years ago.

* * *

Standard Oil Co. of California has announced the election of **George J. O'Brien** as treasurer of the company, succeeding **V. P. Palmer,** who resigned to engage in other business activities. Mr. O'Brien entered the service of the company in 1920 and became a member of the treasurer's office in 1929. In 1931, he was made assistant treasurer.

* * *

Northern Division Manager **H. C. Wurst** of Mid-Continent Petroleum Corp. announces three promotions: **A. R. Hoyer,** former service station agent, Wilmette, Ill., has been appointed retail salesman with headquarters at Iowa City, Iowa; **Emil A. Harten,** formerly bulk station agent at Boone, Iowa, becomes wholesale department salesman, headquartering at Spencer, Iowa; **Bernard Carter,** former Koeta, Iowa, bulk station agent, has been appointed wholesale salesman and will make his headquarters at Washington, Iowa.